

Guidebook for Managing a PCE-Eligible Utility



Financial Management



Operations



Reporting and Compliance



Reducing the cost of energy in Alaska

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Alaska Energy Authority

813 West Northern Lights Blvd. Anchorage, Alaska 99503

(907) 771-3000

(907) 771-3044 Fax

(888) 300-8534 (toll free in Alaska)

akenergyauthority.org

Prepared by:

Neil McMahan, Alaska Energy Authority

Patricia Crofut, Turnagain Press

Connie Fredenberg, Utility Management Assistance

Tara O'Hanley, Turnagain Press

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Welcome

Welcome to the Financial and Operational Management Guide for managers of PCE-Eligible Electric Utilities.

This guide is written to assist electric utility managers. Managers are in charge of the utility's employees, which include operators, office workers, bookkeepers, and maintenance workers. All of these employees play a critical role in supporting the utility and all of these employees have a variety of tasks they are responsible for performing. It is not the manager's job to perform these tasks him/herself, but it is the manager's job to ensure that all of these tasks are performed by utility employees. These tasks must be performed in a timely manner and they must be performed accurately. There must be open communication between all of the employees and the manager to ensure that if something is discovered that threatens the well-being of the utility, the manager will make sure that it is dealt with. This guide is designed to help you keep track of and understand the various roles, responsibilities and tasks required to keep your utility running smoothly.

This guide is divided into three parts: (I) Financial Management, (II) Operations, and (III) Reporting and Compliance.

Part One: Financial Management looks at all of the finances of an electric utility. This part assumes that the actual accounting will be performed by a bookkeeper, a treasurer or a clerk and that the utility is using computerized accounting software, similar to QuickBooks. It starts out with the Chart of Accounts, which is the structure of any accounting system, and discusses creating a budget and the two major financial statements – the Balance Sheet and the Income Statement – which report on all of the account balances. There is a section which lists all of the time-sensitive payroll, reporting, customer and vendor tasks that must be accomplished at certain times in the month, quarter and year. This financial part also describes the process of reading the utility meters and creating the customer invoices that bring the electric income into the utility. This part ends by looking at Financial Performance Indicators, which assess the health of your utility, and also discusses how to set utility rates and provides tips to help you plan for the future.

Part Two: Operations provides a top-level overview of the major topics and tasks that a utility manager will need to oversee and communicate with operations staff on a regular basis. It begins with a general description of a typical rural utility power system and covers the major safety topics that must be considered to protect everyone in their community. It further provides checklists of inspections to occur on a daily, monthly, semi-annual and annual basis as well as milestones to track routine operations and maintenance tasks for major equipment. Furthermore, practical tips are provided on the topics of inventory, work order management and operational performance indicators that will allow managers and utility boards to assess areas of strength and opportunities for improvement.

Part Three: Reporting and Compliance provides in-depth instructions for navigating the Regulatory Commission of Alaska website to locate a utility's past reports. There is a section with instructions for completing fuel reports and detailed discussions of the monthly utility and annual PCE reports to be submitted to the AEA for timely PCE reimbursement.

In addition, you will find templates of many of the forms contained in this manual, available for download on the AEA website (akenergyauthority.org). Together, these spreadsheets can serve as an organized backbone that will help your utility run and function smoothly. Download and customize them to best meet the unique needs of your particular utility.

It is our hope that this guide will serve as a helpful resource that can be referenced on a regular basis in the coming months and years as you manage your local utility. Please don't hesitate to contact our offices with further questions or suggestions for how this document can be improved in the future.

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Part I: Utility Financial Management

Chapter 1: The Chart of Accounts

Section Contents:

Assets

Liabilities

Equity

Income

Expenses

Personnel Expenses

Setting Up Your Own Chart of Accounts

A chart of accounts (COA) is a listing of all the accounts in your electric utility. Each account is an area in the accounting system that holds similar information. For example, all of the office supply purchases are kept in the office supply account. All of the telephone expenses are kept in the telephone account. An important purpose of a COA is to keep track of transactions and separate out what you spend, what you earn, what you own and what you owe. This will quickly give you (and your board or tribal entity) a sense of your utility's financial health. A well-designed COA not only gives you a "big picture" idea of your business, but is also a vital tool to help you comply with financial reporting standards, such as when filing your payroll taxes or completing requirements for the Regulatory Commission of Alaska (RCA) or the Power Cost Equalization (PCE) program.

The COA serves as the foundation for a company's financial record keeping system. It provides a logical structure and makes it easy for your accounting system to reflect changes that may occur at your utility over time, such as adding new equipment or expenses, or taking away categories, such as for loans that you used to owe money on, but have since paid off.

You have the flexibility to tailor your chart of accounts to best suit your utility's needs, but you will definitely have unique categories (accounts) for each type of asset, liability, equity, income and expense. The following discussion looks at each of these account categories in more detail.

As you read through this and the following chapters, remember that a well-designed accounting system is the heart and soul of any well-run business. The number of headaches that you can save yourself, simply by implementing the following ideas and practices, is astounding. Taking the time to learn these tips is an investment in yourself and your utility that will pay off in many different ways, for years to come.

➤ Assets

Asset Accounts = Anything of Value

An asset is anything of lasting value. You can also think of an asset as anything that you can touch and anything that does not get used up like a roll of paper towels. **There are three categories within the asset section:**

Current Assets. Current assets are expected to be changed into cash within one year.

Examples include:

- Checking Account
- Savings Account
- Utility Safe
- Accounts Receivable (the unpaid customer electric balances)
- Employee Advances – advances made to employees prior to payday
- Fuel inventory – value of fuel sitting in tanks waiting to be used

Fixed Assets. Fixed Asset accounts represent the big items that your utility has purchased for long-term use.

Examples include:

- Generators
- Fuel tanks
- Wind turbines
- Load regulator

Other Assets. This is your power plant.

➤ Liabilities

Liability accounts track the utility's debts. It is the money the utility owes others, including creditors, customers, and vendors. While utilities should not take on excess debt, it may sometimes be necessary to borrow money to make a large repair or to upgrade utility equipment. A utility should be careful not to borrow money for daily, operational expenses. These expenses should be paid for with utility income. A utility manager should be concerned if daily operations cannot be financed by utility income.

Current Liabilities

This is the money owed by the electric utility that will be paid back in less than one year. Common examples of current liabilities are:

Accounts Payable	This is the vendor debt. These are all of your unpaid vendor bills.
Credit Cards	Any unpaid balance on a credit card is a current liability. In the Chart of Accounts, each credit card has its own account.
Payroll Liabilities	Every payday, employees have federal and state taxes withheld from their paychecks. The federal taxes are Federal Withholding, Social Security, and Medicare. The state tax is Alaska Unemployment. The utility also pays Social Security, Medicare and Alaska Unemployment for each employee. As long as these taxes are withheld and not yet paid, they are considered Payroll Liabilities. The utility has a debt with the IRS and the State of Alaska.
Fuel Loan	If your utility receives a bridge loan for purchasing fuel from the State of Alaska, this gets paid within the year; therefore, it is a current liability.

Long-term Liabilities

This is money borrowed to purchase a large asset such as a boiler or a genset. It will be in the form of a loan from a bank or perhaps a state agency. Large loans will not be paid back in less than one year; therefore, they are considered long-term liabilities.

➤ Equity

The equity of the electric utility is the actual worth of the utility. Sometimes it is called the Fund Balance. Equity is the difference between the value of the assets and the value of the liabilities.



For example: Mr. Morgan owns a snowmachine that he purchased for **\$12,000**. He has a bank loan for the snowmachine and the balance on the loan is **\$3,000**.

His equity (his ownership) of the snowmachine is worth **\$9,000**.

$$\text{\$12,000 minus \$3,000} = \text{\$9,000}$$

There are two ways to build equity:

1. Income coming into the utility on a daily basis is greater than expenses going out.
2. Grant money is received that does not have to be paid back by the utility.

➤ Income

Electric Income

The Income Accounts represent all of the utility's sources of income. The most obvious source is the sale of electricity. The utility's PCE reports require that the electric income be reported in the following categories:

PCE Reporting Category	Description/Definition
Residential	A home or an apartment where residents live. No business happens here.
Commercial	Commercial customers do not receive Power Cost Equalization (PCE). Examples of commercial customers are the store, church, corporation office, school, processing plant.
Community Facilities	A building or space that benefits everybody in the community, such as the fire hall, tribal office, city office, clinic, community center, VPSO, pump house, tank farm. Community facilities receive Power Cost Equalization (PCE) for all kWh up to the monthly community quota (current population x 70 kWh).
Federal/State Facilities	A building or space that is paid for by either the State of Alaska or the Federal Government. Federal/state customers do not receive Power Cost Equalization (PCE). Examples of this are: Federal Aviation Administration (FAA), Automated Weather Observation System (AWOS), Department of Transportation (DOT).

Other Income

A utility may also have customer service charges for the electric service which may provide income. In the Chart of Accounts, these charges are listed as separate income accounts. Some examples include:

Customer Fees	Sometimes, utilities will charge customers for billing or general fees to handle their electric account.
Penalties	These are fines you charge when a customer fails to pay their bill.
Connect/Disconnect	Standard service charges, such as new customer hook-ups, meter replacements.

Additional income categories required by the PCE reports are:

Grants	Grants can come from a number of sources: the city, tribe, state government, federal government, foundations, non-governmental sources. If your utility is lucky enough to receive a grant, there will be special reporting requirements. Make sure you follow these requirements in an accurate and timely manner.
Pole Rentals	Electric poles are sometimes rented for telephone wires.
Waste Heat In-kind	Sometimes utilities will make agreements to deliver excess heat from the recovery system of the powerhouse to heat buildings. Heat recovery systems are cost effective and provide an incentive for the utility to maintain their system so they may earn additional income.

➤ Expenses

The expense account list of a utility is much longer than the income list. Non-regulated electric utilities must complete annual PCE reports and submit them to the Regulatory Commission of Alaska (see Chapter 24 for more information). In these reports, there is a specific list of expense accounts. If the utility's chart of accounts is set up to match the accounts in the PCE report, completing the report will be much easier.

The expense accounts in the following list will match the expenses listed in the annual PCE report. The annual PCE report has three categories of expense accounts, described below: Personnel Expenses, Operating and Maintenance (O&M) Expenses and General and Administrative (G&A) Expenses.

Personnel Expenses

This category consists of:

- Employees' Gross Wages
- Employer's Payroll Taxes
 - Social Security
 - Medicare
 - Alaska Unemployment
- Workers' Compensation

Operating and Maintenance Expenses

Operating and Maintenance (O&M) Expenses include the items necessary for the day-to-day operation of the electric utility. These are items that you purchase on an ongoing basis directly related to producing electricity. Examples include:

- Fuel Expense
- Purchased Power
- Lube Oil
- Filters
- Small Tools – Small tools should be separated from large tool purchases. Use a purchase price dollar amount such as \$500 to decide which account to use.

- Large Tools – Tool purchases greater than \$500 can be put into this account. The vendor invoices should be filed separately in a folder labeled PCE Annual Report. At the end of the year when it is time to do the Annual PCE report, these purchase invoices will be altogether ready to be handled as depreciation (see Chapter 6: Depreciation) and submitted to the RCA.
- Equipment Rental
- Generator Repairs/Maintenance – This account tracks routine, small dollar purchases that do not extend the life or increase the value of your engines and/or generators. An easy way to decide what gets put into this account is to include any check written for generator repair and maintenance that costs less than \$500.00.
- Other Operating Expenses- This account is used for Gas, Antifreeze and Brush cutting. This information will be transferred to Schedule A of the annual PCE report.



Tip: *If your utility had some expensive equipment and/or generator purchases or repairs, the Regulatory Commission of Alaska may not allow the utility to record this large expense in the Generator Repair and Maintenance expense account. They may decide that this repair is adding value to your genset or other piece of equipment which would be considered an asset rather than an expense. Because these are assets, they will be depreciated (see Chapter 6: Depreciation) in the annual PCE report. The clerk can post these questionable repairs in the Generator specific accounts so that at the end of the year, they can be examined while preparing the Annual Report. Vendor invoices for these repairs should be filed in the PCE Annual Report folder.*

Set up a separate account for each genset that your utility has in the O&M section of the Chart of Accounts.

- Generator No. 1
- Generator No. 2
- Generator No. 3

This is very helpful at the end of the year to immediately see what large repairs and purchases the utility has had to make to keep the utility going. You can also readily see which gensets are requiring repairs.

General and Administrative Expenses

General and Administrative (G&A) Expenses are all of the other expenses that are not directly related to creating electricity. Some of the most common include:

- Outside Professional Services
- Insurance
- Office Supplies
- Postage
- Office Rent
- Travel
- Dues and Licenses
- Training

Other accounts categorized as G&A Expenses include:

- Bad Debt Expense – It is a good idea for the electric utility to have a policy for writing off electric customer accounts that become uncollectible. If a customer passes or moves away and they have a balance, **the utility may decide to write off the balance.** This becomes an expense to the utility. Writing off bad debt will also reduce your Accounts Receivable (total of all unpaid customer accounts). Since accounts receivable is an asset of your utility, it is good to have a realistic number in this account.
- RCA Fees
- Other (see schedule A): This account will include Fax, Cellphones, Telephone, Internet and will be transferred to Schedule A of the annual PCE report.

Other Expenses

There are two types of other expenses on the annual PCE report:

Interest Expense	This is the amount of interest the utility pays for any outstanding loans. A common example of this is the interest charged by the State of Alaska for the bulk fuel loan. You can ask for an Amortization Schedule. This will give you the amount of interest and the amount paid on the principle of the loan for every payment you make to the state. When you write the check for the monthly payment on the fuel loan, part of the check will pay down the balance of the loan. The rest of the check will record the interest expense on the loan payment.
Depreciation Expense	See Chapter 6: Depreciation for an explanation of this.

➤ Setting Up Your Own Chart of Accounts

The following chart provides an example of a standard Chart of Accounts (COA), which includes all the categories that your utility needs to meet your reporting requirements. If you set up your COA according to the following categories, you can be sure that creating reports will go smoothly for you from now on.

Complete Example Chart of Accounts for a PCE-Eligible Utility

ASSETS

Current Assets

Checking Account

Savings Account

Utility Safe

Accounts Receivable

Employee Advances

Fuel inventory

Fixed Assets

Generators

Fuel tanks

Wind turbines

Load regulator

Other Assets

Powerhouse

LIABILITIES

Current Liabilities

Accounts Payable

Credit Cards

Payroll Liabilities

Fuel Loan

EQUITY

Equity

INCOME

Residential

Commercial

Community Facilities

Federal/State Facilities *(continued on next page)*

Complete Example Chart of Accounts for a PCE-Eligible Utility

(continued from previous page)

Customer Fees

Penalties

Connect/Disconnect

Grants

Pole Rentals

Waste Heat In-kind

EXPENSES

Personnel Expenses

Personnel Expenses

Employer's Payroll Taxes

Workers' Compensation

Operating Expenses

Fuel Expense

Purchased Power

Lube Oil

Filters

Small Tools

Large Tools

Equipment Rental Generator Repairs/Maintenance

Generator No. 1

Generator No. 2

Generator No. 3

Other Operating Expenses – Gas, Antifreeze and Brush Cutting *(continued on next page)*

Complete Example Chart of Accounts for a PCE-Eligible Utility

(continued from previous page)

General and Administrative (G&A) Expense

Outside Professional Services

Insurance

Office Supplies

Postage

Office Rent

Travel

Dues and Licenses

Training

Bad Debt Expense

RCA Fees

Other G&A: Fax, Telephone, Internet

Other Expenses

Interest Expense

Depreciation

In following sections, we will examine the two primary financial statements that will provide you with a snapshot picture of the health of your utility. These are known as the Balance Sheet and the Income Statement. The **Balance Sheet** lists your Assets, Liabilities and Equity. The **Income Statement** lists the Income and Expenses.

For now, simply be aware that within the Chart of Accounts, accounts will be listed in order of their appearance in the financial statements. The balance sheet accounts are listed first, followed by the income statement accounts.

Chapter 2: Utility Financial Tasks

Section Contents:

Master Checklist of Tasks to Do

Financial Tasks to be Completed Daily

Financial Tasks to be Completed Biweekly

Financial Tasks to be Completed Monthly

Financial Tasks to be Completed Quarterly

Financial Tasks to be Completed at the End of the Calendar Year

Financial Tasks to be Completed at the End of the Fiscal Year

A Word to the Wise: Frequent Turnover

The best way for a utility to keep their finances in order is to deal with them every day. The utility manager might not be dealing with the day-to-day paperwork, but they are responsible for making sure that the clerk stays on top of the utility's daily business.

The following discussion will provide you with a blueprint for running a successful rural electric utility. Based on several decades' worth of cumulative experience gathered from PCE-Eligible power plants from across the state, here you will find handy checklists for tasks that need to be completed on a regular basis, from every day all the way through to the end of the fiscal year.

Following the master checklist is a detailed discussion of the most important financial tasks to complete and forms to submit to various agencies, including state and federal tax requirements.



➤ Master Checklist of Tasks to Do on a Regular Basis

... Daily:

- Open and sort the mail
- Deal with the vendor bills
- Collect customer electric payments throughout the day
- Reconcile and safeguard your cash
- Handle check/cash exchanges, if you allow them
- Handle payroll advances, if you allow them
- Backup your computer

... Every Two Weeks (Biweekly):

- Pay employees
- Pay payroll taxes
- Create a payroll file
- File copy of powerhouse inspection (See Chapter 15: Inspections)
- Create vendor checks

... Monthly:

- Reconcile bank accounts
- Follow up on uncleared checks and deposits
- Read the electric meters (see Chapter 7: Reading Meters)
- Create customer invoices (see Chapter 8: Customer Invoices and Ledgers)
- Create a balance sheet (see Chapter 5: Balance Sheet)
- Create an income statement (see Chapter 4: Income Statement)
- Create the Monthly PCE Report (see Chapter 22: Utility Monthly Report)
- Review reports for accuracy
- Create Report to Board (See Chapter 21: Reporting to the Utility Board)
- Enter actual monthly numbers in budget versus actual spreadsheet and see if the numbers make sense

Quarterly Federal Payroll Form 941 and State of Alaska Unemployment reports are due on or before:

... Quarterly:

- April 30
- July 31
- October 31
- December 31

... At the End
of the
Calendar
Year:

- Quarterly Federal Payroll Form 941
- State of Alaska Unemployment report
- W-2s, W-3
- 1099s, 1096
- Box up payroll files and create space for new year

... At the End
of the Fiscal
Year:

- Annual PCE report (See Chapter 24: Annual PCE Report)
- Quarterly Federal Payroll Form 941
- Quarterly Alaska Unemployment Report
- Create new budget (See Chapter 3: Creating a Budget)
- Create year-end financial statements
- Box up old files and create space for new year



➤ Financial Tasks to be Completed Daily

Open and sort the mail

Each day when the mail arrives, the office clerk should open and sort the mail.

- The clerk should **distribute mail** that is addressed to specific people in the utility.
- Put all of the vendor **bills in a stack**.
- Put all of the utility electric **income checks in another stack**.
- Group any notices received from any **state or federal entity**.
- Make sure any **IRS notices** are in a stack of their own.
- Immediately throw out any trash mail such as advertisements. Keep the clutter out of the office.

Vendor Bills

Vendor mail usually comes in the form of a vendor bill. Anytime you pick up the telephone and order something, you may later receive a bill from the vendor demanding payment. At any given time, your utility should know exactly how much you owe your vendors (the total of your unpaid bills). In accounting language, this is called **Accounts Payable**. The total of Accounts Payable should be the balance of all of your unpaid vendor bills. This is considered a **liability** of your utility, which is a **debt**.

If you pick up the telephone and order something with the utility **credit card**, this is also a **liability** or a **debt** to your utility, but it is a credit card debt, and instead of receiving a vendor bill you will receive a credit card statement each month listing all of the individual vendors you ordered from throughout the month using your credit card.

Purchases made using a **debit card** automatically process out of your bank account within a couple of days after you use the card. It is a good habit to check your checking and savings account balances frequently – good utility managers will do this at least once a day. Keep track of who has access to your card number, so that you know who to check with in the event a debit occurs without your knowledge or approval.

Good Practices for Maintaining an Organized Office

- Your electric utility should have a file drawer dedicated to **Accounts Payable vendor and credit card files**.
- There should never be any old vendor bills and/or credit card statements hanging around the office.
- The vendor bills should be filed alphabetically once they are paid.
- All of the credit card statements should be in a file. If you have multiple credit cards, there should be a separate file for each credit card.
- You should have unpaid credit card statements and unpaid vendor bills in a separate file for **current items** awaiting payment.
- The clerk should have receipts for every credit card purchase.
- Keep only one year at a time filed in the main office. When a new year arrives, box last year's vendor files.
- If your utility uses QuickBooks, the clerk should enter in all of the newly arrived vendor bills **each day** so that the utility manager knows the total of all the unpaid vendor bills.
- Credit card receipts should be entered into the accounting system right away also.



Tip: A good utility manager makes sure that anyone using the utility credit and/or debit card has approval. Whenever the credit card is used, there should be a receipt (print this from the computer website if ordered online). A good manager will **make sure the clerk has all vendor and credit card receipts**. This is very important to managing the finances of a utility.

Checks and Notices Received in the Mail

It's always great to receive checks in the mail! Most of these incoming checks will be the utility income. Where will these checks come from?

PCE Reimbursement Checks

If the utility is timely and sends out the monthly PCE report, the PCE reimbursement checks will be received monthly throughout the year. When a PCE reimbursement check is received, it should show up on the **Income Statement as a separate line item** in the Income section.

Vendor Refund Checks

When a utility receives a vendor refund check, or any refund check, **it should not be recorded as income**. Refund checks are generally checks written to reimburse the utility for something. If a check is received because of a vendor return, receive the money to the original expense account.



For example: A utility purchased a printer for **\$300.00**.

They recorded this as an Office Supply expense of **\$300.00**.

The printer is returned and the utility receives a refund. The **refund should be recorded** to the Office Supply expense account. This accurately reduces Office Supplies.

Try not to use an expense or income account labeled Reimbursements. Instead, ask yourself why this money is coming back to you and **use the same account** that you originally used to make the purchase.

Collect Customer Payments Throughout the Day

As long as your clerk sends out the invoices regularly at the beginning of each month, your utility should receive a flurry of customer payments in the beginning of the month with payments slowing down as the month continues. These electric payments will arrive:

- As checks in the mail
- Checks made directly to the office by the resident
- Cash paid directly to the office by the resident
- Credit card payments made directly to the office by the resident



Tip: *The utility clerk should never get behind in processing customer electric payments. Each day, any checks, credit card payments and cash received for outstanding electric service should be processed.*

No matter how the payment is made, the clerk should **create a handwritten cash receipt**. The utility keeps **one copy** and the customer receives the **other copy**. It is critical that the cash receipt includes:

- The customer name
- Check number (if there is one)
- Date
- Method of payment (cash, check, credit card)

In the event that your utility undergoes an audit, all of this information will be necessary to show that your accounting records are accurate and complete.

As soon as payment is received, the customer ledger balance needs to be updated.

If the utility uses QuickBooks, a customer payment should immediately be entered into the software.

Important Tips for Processing Different Types of Payments

Payments Received in Cash: If the resident pays cash for their electric service, the clerk will write a cash receipt and deposit the cash in the utility safe. If the utility uses QuickBooks, this means that cash payments will actually be entered as cash deposits into the safe account. At the same time, the customer's electric account will be updated to record the payment.

Utility Safe: It is important to think of the safe as a separate bank account. Since your community does not have a bank, the utility safe serves as a bank. Therefore, it is very important that all of the money going into the safe and leaving the safe is recorded.

Payments Paid by Credit Card: If the resident uses a credit card for their electric service payment, this payment will go directly into the electric bank account but still must be recorded. Credit card payments received throughout the day will be grouped by your credit card company and a batch will be created daily. It is important to group them in the same way in your own files, so that reconciliation is easy. For example, some credit card companies will group the daily deposit by Visa, MasterCard, and Debit card. If the clerk groups them the same way, there will be a daily total for all Visa payments, MasterCard payments and Debit card payments.

Even though the credit card payments will be grouped in batches by the processors and in QuickBooks, it is still necessary for all credit card payments to be recorded separately for each customer. This way, all of your customer ledgers are always kept accurate and up-to-date, and you can quickly reference a history of payments that were made by each customer whenever you need to.

Payments Paid by Check: Some residents will mail in checks or come into the office and pay by check. Cash receipts should be given for check payments as well as cash. All customer ledgers must be updated. Accounting software customer accounts should be updated. The checks will remain in the office until a bank deposit is made.

Making a Bank Deposit

It is very important to **keep a paper trail** of what happens in the utility. Whenever a bank deposit is made:

- **Make a copy** of all checks
- On the copies of the checks, **label each check**. Just handwrite why the check was received (e.g., Electric, Refund, Grant Name). Also note if they are:
 - Utility payments
 - State and/or federal payments
 - Vendor refunds.
- Add up all the checks going to the bank and **create a deposit slip**.
- Add up all of the xeroxed checks and **compare the total** with the deposit slip.
- **Attach a copy** of the deposit slip to the check copies and file. Utility deposits should be **filed together** by month and year.
- **Send deposit** to the bank.
- **Record the deposit** in your accounting software.



Notices Received from Federal/State Agencies

Each day, deal with any letters or notices received. The clerk should always open and read any letters and/or notices. The letters or notices should be immediately given to the appropriate person. If the letter has a deadline written on it, the clerk should highlight the deadline or point it out to the manager so that opportunities are not missed.

Sometimes, federal or state agencies will automatically deposit a check in the utility bank account. If the utility has online access, this check will show up and a deposit should be recorded in QuickBooks. It is very important that the utility knows where all of its money is coming from. Do some research if it is an unknown deposit.

Internal Revenue Service Notices Received

Tell your clerk you want to know about any notices received from the Internal Revenue Service. IRS notices should never be ignored. The clerk needs to deal with these immediately. The top right-hand corner of the notice will have the year and the month that the IRS needs information for. The information needed will usually be an overdue payroll tax report or a discrepancy with payroll taxes.

Ignoring these notices will never go well for your utility. It will most likely result in interest and penalties. The IRS also has the authority to put a lien on your bank accounts. A lien is when the IRS instructs your bank to freeze your funds. When a lien is on your checking account, you are unable to use your money. The best way to handle these notices is to immediately call the telephone number on the notice and learn how you can fix the problem.



Do not be afraid to call the IRS. They are usually very willing to assist you with any IRS problem. Once you have learned what the problem is make every effort to correct the problem right away.

A good utility manager will inform the clerk they want to be made aware of any IRS notices. Once they are aware of them, they will assist the clerk in correcting the problem.

Reconcile and Safeguard the Cash

Whenever there is cash in an office, it becomes necessary to build in controls to safeguard it. These controls usually involve a separation of duties. This means your utility should **never have only one person** receiving the cash, placing the cash in the safe, moving the cash from the safe to a checking account and recording the cash deposits in the accounting system.

Oftentimes, there are simply not enough employees to divide up all of the cash functions. If an electric utility has very few employees, it might need to use one of the operators to match the cash received to the cash receipts and to reconcile this amount with the cash in the safe. While reconciling the cash balance in the safe, it may come up short or over what it should be. **Each day, this shortage should be recorded** as an expense or an overage as income. If these differences are large, the manager needs to step in and determine what the problem is. Is the clerk making math errors? Is the clerk careless and just keeps making mistakes? Is the clerk stealing? Is someone else in the office stealing?

To further protect the cash:

- Keep a manual log of all cash going in and out of the safe daily.
- Reconcile the safe daily. The clerk and one other employee should count all of the cash and the coins in the safe and compare the amount to the manual log and to the balance in QuickBooks.
- Get in the habit of grouping the cash bills by ones, fives, tens and so on. Keep your coins rolled in wrappers. If you don't have one already, purchase a cash tray so that you can keep all of the cash in order in your safe. It is easier to count that way also.
- The utility may decide on a minimum amount of cash to keep on hand in the safe. Whatever that amount is, any money over that minimum amount would get deposited in the bank and this would be recorded as a Transfer from the safe to the Checking Account.

Handle Check/Cash Exchanges (if you allow them)

A common mistake made by utility clerks is to record Check/Cash Exchanges as Income. Since your community does not have a bank, it is common for residents to go into the utility or the store or the city with their paycheck and ask to cash it.

A check/cash exchange has no effect on the Income Statement. The utility is swapping cash from their safe equal to the amount of the check. The total in the safe remains the same. There needs to be an accounting entry however, because the cash in the safe is decreasing and the check will need to be deposited.

The correct way to handle this is:

- When making a bank deposit, check/cash exchange checks will be copied by the clerk along with any other checks being deposited in the bank. On the check copy, s/he will label the check as a check/cash exchange. Proceed with the bank deposit as described in this chapter.
- The accounting entry in QuickBooks is a decrease in the safe and an increase in the checking account.



Handle Payroll Advances

Some utilities provide payroll advances to their employees. Never forget that this is a loan to your employees. A payroll advance account is not an expense account. It is set up just like your customer electric accounts as a receivable. If you decide to offer this service to your employees, be sure to keep track and make sure that this money is paid back to your utility. To track these payroll advances:

- Set up a current asset account and name it, "Employee Advances"
- When you give an employee an advance, record it in this account
- Take the money back at the next payroll by reducing the employee's paycheck

The Employee Advance account appears on the Balance Sheet in the Current Asset section along with your Accounts Receivable account. Each payday, the Employee Advance account should be zeroed out when one or more of the employees pay back their advances through a payroll deduction.

Back Up Your Computer

The utility financial computer should be backed up to an external disk at least once a day. If the clerk has spent the entire morning entering data, it is a good idea to back it up before going to lunch and then again at the end of the day.

There are good reasons for frequent backups:

- The financial computer contains all of the very important financial data of the electric utility and it needs to be protected.
- Computers are not built to last. At any time, the financial computer's hard drive can stop working and it may become impossible to get into the computer accounting file.
- The financial computer is at risk for theft, fire or damage and the contents should always be backed up and stored somewhere else away from the computer.
- If the utility lost the financial data file, it would take hours and hours to create another file and much of the historical data would be forever lost.



Backup Procedure: *Purchase a flash drive with enough space to hold several copies of your financial data file. Each time a backup is performed, it will go on the flashdrive. QuickBooks will place three backup files on the flashdrive and then start deleting the oldest copy and replacing it with the newest copy so there will always be three backups on the flashdrive.*

NEVER leave the flashdrive in your computer. If something happens to your computer, your flashdrive will go with it.

A good place to store the flashdrive is in the office safe. The safe is locked and it is fire resistant. The power plant may be a great place to store a backup. It is offsite from the office and probably has a fire suppression system.

➤ Financial Tasks to be Handled Bi-Weekly

Pay Employees

Most utilities pay their employees bi-weekly. The utility clerk will collect the timecards and verify that each timecard is calculated correctly. They will then enter the employee hours into QuickBooks, verify that the payroll taxes have been deducted, verify that the paycheck is accurate and either print the paychecks or send them Direct Deposit into the employee's bank account.

Whether your electric utility is a monthly or a semiweekly payroll tax depositor, get in the habit of paying your payroll taxes every payday. Penalties and interest from the Internal Revenue Service for late payroll taxes can be very expensive. The federal payroll taxes are paid through the website www.eftps.gov. A username and a password are needed for this website.

Pay Payroll Taxes

Electric utilities in Alaska pay the payroll taxes detailed below:

941 Taxes

941 Taxes include Federal Withholding Tax, Medicare and Social Security taxes. Every employee pays:

- Federal Withholding Tax, which is based on their marital status and number of exemptions;
- Medicare, which is 1.45% of their gross pay; and
- Social Security, which is 6.2% of their gross pay.

The electric utility matches the Medicare and Social Security paid by each employee. The utility is assigned an **Employer's Identification Number (EIN)** issued by the Internal Revenue Service. Use this number for paying the federal payroll taxes and for any communications regarding payroll.

Federal Unemployment Tax

Rural utilities do not pay this tax.

State of Alaska Unemployment Taxes (ESC)

Alaska unemployment taxes are deducted from the employee's gross pay each payday. The employee pays 0.6% of gross pay. This rate may change. Each year the State of Alaska will send you a notice of your tax rate for the following year. When an employee has earned \$39,000.00 in a calendar year the tax shuts off. The employer also pays Alaska unemployment tax and has a rate set by the State of Alaska. This rate is multiplied by the employee's gross pay. State of Alaska Unemployment taxes are paid each quarter by the end of the month following the end of the quarter (further described later in this chapter). The State of Alaska issues each entity a tax paying number which will go on the quarterly report and should also be printed on the tax check. Use this number for any communications with the State of Alaska.

What Kind of Tax?	Who Pays?	How Much?	When's it Due?
Federal Withholding	Employee	Depends – check their current W-4 on file	Each pay period
Medicare	Employee	1.45% of gross pay	Each pay period
Medicare	Employer (the utility)	1.45% of gross pay	Each pay period
Social Security	Employee	6.2% of gross pay	Each pay period
Social Security	Employer (the utility)	6.2% of gross pay	Each pay period
AK Unemployment	Employee	0.6% of gross pay	End of Fiscal Quarter
AK Unemployment	Employer	Rate set by State of AK	End of Fiscal Quarter

Create a Payroll File

When the payroll is complete, the clerk should create a payroll file. This file should include:

- Employee timecards
- Payroll check stubs
- QuickBooks Employee Payroll Summary Report
- Screen printing from the EFTPS website as proof of federal payroll tax payment
- The payroll file should be stapled together and filed so it can be easily located.

How is Payroll Handled in Accounting?

Each payday when the paychecks are created, there are many things happening behind the scenes in the QuickBooks file:

<p>Income Statement</p>	<ul style="list-style-type: none"> • Salaries Expense goes up. The Gross Pay for each paycheck will be added to this account. • Payroll Tax Expense goes up. Only the employer's taxes are added to this account. This will include Medicare Employer portion, Social Security Employer portion, AK Unemployment Employer portion.
<p>Balance Sheet</p>	<ul style="list-style-type: none"> • Checking Account goes down by the amount of the paychecks. • Payroll Liabilities goes up by the amount of the employee's and the employer's taxes • This liability account remains increased until the payroll taxes are paid, then it will go down.

➤ Financial Tasks to be Handled Monthly

Reconcile bank accounts

Every month, as soon as the bank statement is received, it should be reconciled. This means that the computerized accounting file needs to agree with the bank statement. This is done by comparing everything on the bank statement---checks, deposits, debit card transactions with the computer file. Utility managers should have online access to their bank accounts. It is very important to be able to immediately see any account balances and copies of checks and deposits. Reconciling the bank account will uncover any errors made by the clerk and/or the bank. Federal and state income sometimes is deposited directly into the bank account. Reconciling will help identify this utility income right away.

Follow up on uncleared checks and deposits

As the bank account is being reconciled, any old uncleared checks and deposits should be looked at. With frequent clerk turnover and clerks going on vacation or being on sick leave, checks and deposits are sometimes created in error in QuickBooks by new or substitute employees with no training. These checks and deposits created in error will cause your bank balance to be inaccurate even if the account is reconciled. Checks and deposits which will never be cleared should be voided so that the balance is more accurate.

The utility manager should look over the bank statement each month. Ask the bank to send the utility a bank statement with check images. Look over each check image and ask questions about any checks that seem abnormal.



Other monthly tasks to complete described elsewhere in this manual:

- Read the electric meters (see Chapter 7: Reading Meters)
- Create the customer invoices (see Chapter 8: Customer Invoices and Ledgers)
- Create balance sheet (see Chapter 5: Balance Sheet)
- Create income statement (see Chapter 4: Income Statement)
- Review reports for accuracy
- Enter actual monthly numbers in budget versus actual spreadsheet and see if the numbers make sense (see Chapter 10: Utility Financial Indicators)
- Report to Board or governing body (see Chapter 22: Reporting to the Utility Board)

➤ Financial Tasks to be Handled Quarterly

941 Report to the Internal Revenue Service

Each quarter, the utility must submit a 941 Report to the Internal Revenue Service. This report is due the last day of the month following the end of the quarter.

Reporting Period	Dates Covered	Filing Deadline
Quarter 1	January 1 through March 31	April 30
Quarter 2	April 1 through June 30	July 31
Quarter 3	July 1 through September 30	October 31
Quarter 4	October 1 through December 31	January 31

A sample 941 report is provided on the following page. Form 941 is created by the accounting software.



Information you need to be able to fill out IRS Form 941:

1. Is your utility a monthly or a semiweekly depositor? The IRS will tell you what you are, and you will have to check the appropriate box. It is highly recommended no matter what the IRS requires, that you **deposit your payroll taxes every payday**. Check Part 2, Page 2 of the 941 if you are a monthly depositor. **Make sure it is filled out.**
2. Are you a nonprofit or governmental entity? Answer **Yes**
3. Make sure that **Line 14 is zero**. You should owe no taxes if you have been paying them each payday. If Line 14 is not zero, you will have to examine what taxes you have paid and what taxes you owe and figure out why there is a difference

If you pay your payroll taxes each payday, you will not owe the Internal Revenue Service any money with this quarterly 941 report. The report must be filed on time each quarter; however, because **the Internal Revenue Service will fine the utility if it is late or not filed.**

Employer identification number (EIN) -

Name (not your trade name)

Trade name (if any)

Address

Number Street Suite or room number

City State ZIP code

Foreign country name Foreign province/county Foreign postal code

Report for this Quarter of 2019
 (Check one.)

1: January, February, March

2: April, May, June

3: July, August, September

4: October, November, December

Go to www.irs.gov/Form941 for instructions and the latest information.

Read the separate instructions before you complete Form 941. Type or print within the boxes.

Part 1: Answer these questions for this quarter.

1	Number of employees who received wages, tips, or other compensation for the pay period including: <i>Mar. 12</i> (Quarter 1), <i>June 12</i> (Quarter 2), <i>Sept. 12</i> (Quarter 3), or <i>Dec. 12</i> (Quarter 4)	1	<input type="text"/>
2	Wages, tips, and other compensation	2	<input type="text"/>
3	Federal income tax withheld from wages, tips, and other compensation	3	<input type="text"/>
4	If no wages, tips, and other compensation are subject to social security or Medicare tax	<input type="checkbox"/> Check and go to line 6.	
	Column 1	Column 2	
5a	Taxable social security wages	<input type="text"/> × 0.124 =	<input type="text"/>
5b	Taxable social security tips	<input type="text"/> × 0.124 =	<input type="text"/>
5c	Taxable Medicare wages & tips	<input type="text"/> × 0.029 =	<input type="text"/>
5d	Taxable wages & tips subject to Additional Medicare Tax withholding	<input type="text"/> × 0.009 =	<input type="text"/>
5e	Add Column 2 from lines 5a, 5b, 5c, and 5d	5e	<input type="text"/>
5f	Section 3121(q) Notice and Demand—Tax due on unreported tips (see instructions)	5f	<input type="text"/>
6	Total taxes before adjustments. Add lines 3, 5e, and 5f	6	<input type="text"/>
7	Current quarter's adjustment for fractions of cents	7	<input type="text"/>
8	Current quarter's adjustment for sick pay	8	<input type="text"/>
9	Current quarter's adjustments for tips and group-term life insurance	9	<input type="text"/>
10	Total taxes after adjustments. Combine lines 6 through 9	10	<input type="text"/>
11	Qualified small business payroll tax credit for increasing research activities. Attach Form 8974	11	<input type="text"/>
12	Total taxes after adjustments and credits. Subtract line 11 from line 10	12	<input type="text"/>
13	Total deposits for this quarter, including overpayment applied from a prior quarter and overpayments applied from Form 941-X, 941-X (PR), 944-X, or 944-X (SP) filed in the current quarter	13	<input type="text"/>
14	Balance due. If line 12 is more than line 13, enter the difference and see instructions	14	<input type="text"/>
15	Overpayment. If line 13 is more than line 12, enter the difference	<input type="text"/>	Check one: <input type="checkbox"/> Apply to next return. <input type="checkbox"/> Send a refund.

▶ You MUST complete both pages of Form 941 and SIGN it. **Next** ▶

Name (not your trade name)

Employer identification number (EIN)

Part 2: Tell us about your deposit schedule and tax liability for this quarter.

If you are unsure about whether you are a monthly schedule depositor or a semiweekly schedule depositor, see section 11 of Pub. 15.

16 Check one: [] Line 12 on this return is less than \$2,500 or line 12 on the return for the prior quarter was less than \$2,500, and you didn't incur a \$100,000 next-day deposit obligation during the current quarter.

[] You were a monthly schedule depositor for the entire quarter. Enter your tax liability for each month and total liability for the quarter, then go to Part 3.

Tax liability: Month 1 []

Month 2 []

Month 3 []

Total liability for quarter []

Total must equal line 12.

[] You were a semiweekly schedule depositor for any part of this quarter. Complete Schedule B (Form 941), Report of Tax Liability for Semiweekly Schedule Depositors, and attach it to Form 941.

Part 3: Tell us about your business. If a question does NOT apply to your business, leave it blank.

17 If your business has closed or you stopped paying wages [] Check here, and enter the final date you paid wages [] / [] / [] .

18 If you are a seasonal employer and you don't have to file a return for every quarter of the year . . . [] Check here.

Part 4: May we speak with your third-party designee?

Do you want to allow an employee, a paid tax preparer, or another person to discuss this return with the IRS? See the instructions for details.

[] Yes. Designee's name and phone number [] []

Select a 5-digit Personal Identification Number (PIN) to use when talking to the IRS. [] [] [] [] []

[] No.

Part 5: Sign here. You MUST complete both pages of Form 941 and SIGN it.

Under penalties of perjury, I declare that I have examined this return, including accompanying schedules and statements, and to the best of my knowledge and belief, it is true, correct, and complete. Declaration of preparer (other than taxpayer) is based on all information of which preparer has any knowledge.



Sign your name here

[]

Print your name here

[]

Print your title here

[]

Date [] / [] / []

Best daytime phone [] [] [] [] [] []

Paid Preparer Use Only

Check if you are self-employed . . . []

Preparer's name []

PTIN []

Preparer's signature []

Date [] / [] / []

Firm's name (or yours if self-employed) []

EIN []

Address []

Phone [] [] [] [] [] []

City []

State []

ZIP code [] [] [] [] [] []

Quarterly State of Alaska Unemployment Report

Each quarter, the utility must submit a report to the State of Alaska reporting on their employee wages and unemployment tax.

State unemployment taxes are paid quarterly; therefore, the utility will include payment for total state unemployment taxes owed each quarter with their report. The State unemployment tax amounts are kept in the Payroll Liability accounts on the Balance Sheet until they are paid each quarter. An example of a State of Alaska Unemployment Report is provided on the following page.

Every Payday:	<ul style="list-style-type: none"> • The employee pays 0.6% of their gross pay, and • The employer pays a percentage assigned by the State of Alaska
Every Quarter:	Submit State of Alaska Unemployment Report. Include all employees' deductions plus the utility's unemployment tax.

Following is an example of the **Alaska Quarterly Contribution Report**. Here are some tips to keep in mind when you file the report for your utility:

- **Box 5 and 6** will tell you how much your utility owes for state unemployment taxes. This tax is paid quarterly, so include a check when you file this report.
- Your accounting software will complete this form **except boxes 13 and 14**.
- Each employee must have a **job code** supplied by the State of Alaska and a **geographic code**. Look at your forms from prior quarters for these codes. If you can't find a past report, call the State of Alaska or you can go to the following link and look up these codes.

http://labor.alaska.gov/estax/forms/toc_forms.htm

Click on the links that say: Geographic Area Code Map and Occupational Coding Manual

Alaska Quarterly Contribution Report

THE 2019 TAXABLE WAGE BASE FOR EACH EMPLOYEE IS \$39,900

Quarter ending: _____

Due date: _____

Employer account no: _____

FEIN:
Name:
Address:

1. For each month, report the number of workers who worked during or received pay for the payroll period, which includes the 12 th of the month.		<i>If none enter "0"</i>		
		1 st Month	2 nd Month	3 rd Month
2. Total reportable wages paid this quarter. (See instructions, page 2)		\$ _____		
3. Less excess wages over the taxable wage base.		(\$ _____)		
4. Taxable wages paid this quarter.		\$ _____		
5. Employer's contribution	Employer's rate %	\$ _____		
6. Employee's contribution	Employee's rate .50 %	\$ _____		
7. Total contributions due	%	\$ _____		
8. Amount remitted		\$ _____		
9. Wages reported to other states? See instructions explaining this on page 2.		<input type="checkbox"/> Yes		

A report must be filed even if no wages are paid for the quarter.

You may now file your quarterly contribution report online. Please visit our website located at labor.alaska.gov/estax or call (888) 448-3527. To amend your quarterly report, please submit a "Correction of Wage Item," Form TADJ also available online.

Notice to employers: Wage information and other confidential UC information may be requested and utilized for other authorized governmental purposes, including, but not limited to, verification of an individual's eligibility for other government programs.

***See area map for geographic location codes**

	10. Employee's Social Security Number	11. Employee's name – type or print (Do not list more than once.)			12. Reportable wages paid this quarter. (No negative wages)	13. Full occupational title or code	14. Geographic code *
		Last	First	M.I.			
E							
N							
D							
C							
O							
L							
O							
N							
S							
O							
E							
T							
C							
S							
H							
T							
E							
A							
C							
P							
K							
L							
S							
E							

DO NOT provide double-sided pages for wage detail

Make checks payable to Alaska Department of Labor and Workforce Development. If you have any questions, call toll free (888) 448-3527 or email esd.tax@alaska.gov .	15. Total number of pages	16. Total reportable wages - all pages (Same total as in block 2 above.) \$ _____
---	---------------------------	--

I hereby certify that the information on this report is true and correct.

Signed: _____ Title: _____ Date: _____

Printed name: _____ Contact telephone: () _____

Alaska Department of Labor and Workforce Development, Employment Security Tax, P.O. Box 115509, Juneau AK 99811-5509



Tip: *The Alaska state unemployment tax is based on how many employees from your utility end up collecting state unemployment. If you have a **stable workforce** at your utility, **your company rate will be lower** than a utility that had a workforce with frequent turnover.*

*If you think your rate is too high, **give the state a call** and discuss your rate. In December of each year, the State of Alaska will send you your rates for the upcoming year. Make sure you **update your rates** in your accounting software.*

➤ Financial Tasks to be Handled at the End of the Calendar Year

941 Report to the Internal Revenue Service

Please refer to the Quarterly Tasks discussed earlier in this chapter.

State of Alaska Unemployment Report

Please refer to the Quarterly Tasks discussed earlier in this chapter.

W-2

The W-2 form is the document an employer is required to send to each of their employees and the Internal Revenue Service (IRS) at the end of the year. The form reports the employee's annual wages and the amount of taxes withheld from his or her paychecks. **The due date for this form to be filed is January 31.**

If you are using QuickBooks Pro, do not purchase Form W-2 at the office supply store. They are very expensive. You can print these forms right from the software on blank paper and it is acceptable by the IRS.

Prior to completing the W-2, it is critical that the clerk:

- Reconcile the payroll bank account for the entire year.
- Investigate any paychecks in the payroll bank account that were created in the current year that have not been cleared. These paychecks are increasing the employees' wages on their W-2s which will increase their taxes. Find out why they have not cleared. Are they duplicates made in error? Did the employee not cash it yet? If the uncleared checks are mistakes, void them so that the employee's wages are not increased in error.

W-3

Form W-3 is a cover sheet for all of the W-2s. It reports on the total number of W-2s, total gross wages and total taxes withheld.

Employees will often come back into the office because they lost their W-2. Make sure you keep your copies in a place where you can find them. QuickBooks will let you print W-2 forms again for one, two or several employees at a time.



1099

You must give Form 1099 to any independent contractor that was paid greater than \$600 in a calendar year.

If a contractor was paid for labor and for parts, it is **only the labor** that is reported. Form 1099 must be **provided to every independent contractor** meeting these employment criteria by January 31 of each year. Although QuickBooks will print Form 1099, it will not print it in an acceptable format. **You will have to purchase the forms.** Make sure you purchase these 1099s before the year ends. The stores do not reorder them. When they are gone, they are gone. Purchase extras in case you make a mistake.

Following is an example of a 1099. The independent contractor amount will go in Box 7: Nonemployee Compensation.

22222		a Employee's social security number		OMB No. 1545-0008					
b Employer identification number (EIN)			1 Wages, tips, other compensation		2 Federal income tax withheld				
c Employer's name, address, and ZIP code			3 Social security wages		4 Social security tax withheld				
			5 Medicare wages and tips		6 Medicare tax withheld				
			7 Social security tips		8 Allocated tips				
d Control number			9		10 Dependent care benefits				
e Employee's first name and initial		Last name		Suff.		11 Nonqualified plans	12a C o d e		
						13 Statutory employee <input type="checkbox"/>	Retirement plan <input type="checkbox"/>	Third-party sick pay <input type="checkbox"/>	12b C o d e
						14 Other	12c C o d e	12d C o d e	
f Employee's address and ZIP code									
15 State Employer's state ID number		16 State wages, tips, etc.	17 State income tax	18 Local wages, tips, etc.	19 Local income tax	20 Locality name			
-----		-----	-----	-----	-----	-----			

Form **W-2** Wage and Tax Statement
 Copy 1—For State, City, or Local Tax Department

2019

Department of the Treasury—Internal Revenue Service

DO NOT STAPLE

33333		a Control number		For Official Use Only ▶ OMB No. 1545-0008				
b Kind of Payer (Check one)	941 <input type="checkbox"/>	Military <input type="checkbox"/>	943 <input type="checkbox"/>	944 <input type="checkbox"/>	b Kind of Employer (Check one)	None apply <input type="checkbox"/>	501c non-govt. <input type="checkbox"/>	Third-party sick pay (Check if applicable) <input type="checkbox"/>
	CT-1 <input type="checkbox"/>	Hshld. emp. <input type="checkbox"/>	Medicare govt. emp. <input type="checkbox"/>	State/local non-501c <input type="checkbox"/>		State/local 501c <input type="checkbox"/>	Federal govt. <input type="checkbox"/>	
c Total number of Forms W-2		d Establishment number		1 Wages, tips, other compensation		2 Federal income tax withheld		
e Employer identification number (EIN)				3 Social security wages		4 Social security tax withheld		
f Employer's name				5 Medicare wages and tips		6 Medicare tax withheld		
g Employer's address and ZIP code				7 Social security tips		8 Allocated tips		
				9		10 Dependent care benefits		
				11 Nonqualified plans		12a Deferred compensation		
h Other EIN used this year				13 For third-party sick pay use only		12b		
15 State	Employer's state ID number			14 Income tax withheld by payer of third-party sick pay				
16 State wages, tips, etc.		17 State income tax		18 Local wages, tips, etc.		19 Local income tax		
Employer's contact person				Employer's telephone number		For Official Use Only		
Employer's fax number				Employer's email address				

Under penalties of perjury, I declare that I have examined this return and accompanying documents, and, to the best of my knowledge and belief, they are true, correct, and complete.

Signature ▶ Title ▶ Date ▶

Form **W-3 Transmittal of Wage and Tax Statements** **2019** Department of the Treasury Internal Revenue Service

Send this entire page with the entire Copy A page of Form(s) W-2 to the Social Security Administration (SSA). Photocopies are not acceptable. Do not send Form W-3 if you filed electronically with the SSA. Do not send any payment (cash, checks, money orders, etc.) with Forms W-2 and W-3.

Reminder

Separate instructions. See the 2019 General Instructions for Forms W-2 and W-3 for information on completing this form. Do not file Form W-3 for Form(s) W-2 that were submitted electronically to the SSA.

Purpose of Form

Complete a Form W-3 Transmittal only when filing paper Copy A of Form(s) W-2, Wage and Tax Statement. Don't file Form W-3 alone. All paper forms **must** comply with IRS standards and be machine readable. Photocopies are **not** acceptable. Use a Form W-3 even if only one paper Form W-2 is being filed. Make sure both the Form W-3 and Form(s) W-2 show the correct tax year and Employer Identification Number (EIN). Make a copy of this form and keep it with Copy D (For Employer) of Form(s) W-2 for your records. The IRS recommends retaining copies of these forms for four years.

E-Filing

The SSA strongly suggests employers report Form W-3 and Forms W-2 Copy A electronically instead of on paper. The SSA provides two free e-filing options on its Business Services Online (BSO) website.

- **W-2 Online.** Use fill-in forms to create, save, print, and submit up to 50 Forms W-2 at a time to the SSA.
- **File Upload.** Upload wage files to the SSA you have created using payroll or tax software that formats the files according to the SSA's *Specifications for Filing Forms W-2 Electronically (EFW2)*.

W-2 Online fill-in forms or file uploads will be on time if submitted by **January 31, 2020**. For more information, go to www.SSA.gov/bso. First time filers, select "Register"; returning filers select "Log In."

When To File Paper Forms

Mail Form W-3 with Copy A of Form(s) W-2 by **January 31, 2020**.

Where To File Paper Forms

Send this entire page with the entire Copy A page of Form(s) W-2 to:

**Social Security Administration
Direct Operations Center
Wilkes-Barre, PA 18769-0001**

Note: If you use "Certified Mail" to file, change the ZIP code to "18769-0002." If you use an IRS-approved private delivery service, add "ATTN: W-2 Process, 1150 E. Mountain Dr." to the address and change the ZIP code to "18702-7997." See Pub. 15 (Circular E), Employer's Tax Guide, for a list of IRS-approved private delivery services.

For Privacy Act and Paperwork Reduction Act Notice, see the separate instructions.

Form 1096 Department of the Treasury Internal Revenue Service	Annual Summary and Transmittal of U.S. Information Returns	OMB No. 1545-0108 2019
FILER'S name Street address (including room or suite number) City or town, state or province, country, and ZIP or foreign postal code		
Name of person to contact		Telephone number
Email address		Fax number
1 Employer identification number		2 Social security number
3 Total number of forms		4 Federal income tax withheld \$
5 Total amount reported with this Form 1096 \$		For Official Use Only
6 Enter an "X" in only one box below to indicate the type of form being filed.		
7 Form 1099-MISC with NEC in box 7, check <input type="checkbox"/>		
W-2G 32	1097-BTC 50	1098 81
1098-C 78	1098-E 84	1098-F 03
1098-Q 74	1098-T 83	1099-A 80
1099-B 79	1099-C 85	1099-CAP 73
1099-DIV 91	1099-G 86	1099-INT 92
1099-K 10	1099-LS 16	
1099-LTC 93	1099-MISC 95	1099-OID 96
1099-PATR 97	1099-Q 31	1099-QA 1A
1099-R 98	1099-S 75	1099-SA 94
1099-SB 43	3921 25	3922 26
5498 28	5498-ESA 72	5498-QA 2A
5498-SA 27		

Return this entire page to the Internal Revenue Service. Photocopies are not acceptable.

Under penalties of perjury, I declare that I have examined this return and accompanying documents and, to the best of my knowledge and belief, they are true, correct, and complete.

Signature ▶

Title ▶

Date ▶

Instructions

Future developments. For the latest information about developments related to Form 1096, such as legislation enacted after it was published, go to www.irs.gov/Form1096.

Reminder. The only acceptable method of electronically filing information returns listed on this form in box 6 with the IRS is through the FIRE System. See Pub. 1220.

Purpose of form. Use this form to transmit paper Forms 1097, 1098, 1099, 3921, 3922, 5498, and W-2G to the IRS.

Caution: If you are required to file 250 or more information returns of any one type, you must file electronically. If you are required to file electronically but fail to do so, and you do not have an approved waiver, you may be subject to a penalty. For more information, see part F in the 2019 General Instructions for Certain Information Returns.

Forms 1099-QA and 5498-QA can be filed on paper only, regardless of the number of returns.

Who must file. Any person or entity who files any of the forms shown in line 6 above must file Form 1096 to transmit those forms to the IRS.

Enter the filer's name, address (including room, suite, or other unit number), and taxpayer identification number (TIN) in the spaces provided on the form. The name, address, and TIN of the filer on this form must be the same as those you enter in the upper left area of Forms 1097, 1098, 1099, 3921, 3922, 5498, or W-2G.

When to file. File Form 1096 as follows.

- With Forms 1097, 1098, 1099, 3921, 3922, or W-2G, file by February 28, 2020.

Caution: We recommend you file Form 1099-MISC, as a **stand-alone** shipment, by January 31, 2020, if you are reporting **nonemployee compensation (NEC)** in box 7. Also, check box 7 above.

- With Forms 5498, file by June 1, 2020.

Where To File

Send all information returns filed on paper with Form 1096 to the following.

If your principal business, office or agency, or legal residence in the case of an individual, is located in

Use the following address

Alabama, Arizona, Arkansas, Delaware, Florida, Georgia, Kentucky, Maine, Massachusetts, Mississippi, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Texas, Vermont, Virginia

Department of the Treasury
 Internal Revenue Service Center
 Austin, TX 73301

9595

VOID

CORRECTED

PAYER'S name, street address, city or town, state or province, country, ZIP or foreign postal code, and telephone no.		1 Rents		OMB No. 1545-0115	
		\$		2019	
		2 Royalties			
PAYER'S TIN		3 Other income		4 Federal income tax withheld	
		\$		\$	
		5 Fishing boat proceeds		6 Medical and health care payments	
RECIPIENT'S TIN		\$		\$	
RECIPIENT'S name		7 Nonemployee compensation		8 Substitute payments in lieu of dividends or interest	
Street address (including apt. no.)		\$		\$	
City or town, state or province, country, and ZIP or foreign postal code		9 Payer made direct sales of \$5,000 or more of consumer products to a buyer (recipient) for resale <input type="checkbox"/>		10 Crop insurance proceeds	
		\$		\$	
Account number (see instructions)		FATCA filing requirement <input type="checkbox"/>		2nd TIN not <input type="checkbox"/>	
13 Excess golden parachute payments		14 Gross proceeds paid to an attorney			
\$		\$		\$	
15a Section 409A deferrals		15b Section 409A income		16 State tax withheld	
\$		\$		\$	
				17 State/Payer's state no.	
				18 State income	
				\$	

Miscellaneous Income

Copy A For Internal Revenue Service Center

File with Form 1096.

For Privacy Act and Paperwork Reduction Act Notice, see the 2019 General Instructions for Certain Information Returns.

1096

Form 1096 must be submitted along with the 1099s. Just like the W-3, the 1096 totals up the number of forms and the total wages. The 1096 is sold with the 1099 at the office supply store. Once again, it is very important that you [keep copies](#).



Box Up Old Files

At the end of the calendar year, traffic in the office slows down. After all of the necessary reports are created, it is a great time to organize the office:

- Close out the calendar year by [boxing up all of the old vendor files and payroll files](#). This added space should make room for the new year's vendor and payroll files.
- Make sure you [clearly label the box](#) with the date and [write down the contents on the outside](#) of the box.
- Keep these boxes handy as you may have to [refer to them](#) throughout the upcoming year.

The electric utility probably has stored boxes of files from prior years. There are rules governing how long old files should be kept in an office. The time periods vary according to office documents. Use the following [Retention Schedule](#) as a guide for how long you should keep your various types of office files:

How Long to Keep Important Files

<p>Keep for 1 Year:</p>	<ul style="list-style-type: none"> • General correspondence with customers and vendors • Purchase Orders • Office notebooks
<p>Keep for 3 Years:</p>	<ul style="list-style-type: none"> • Employee personnel records • Employment applications • Expired insurance policies • Timecards for hourly employees
<p>Keep for 7 Years</p>	<ul style="list-style-type: none"> • Accident reports and claims • Accounts payable/receivable ledgers & schedules • Banks statements and reconciliations • Cancelled checks • Tax records • Expired contracts and leases • Invoices • Payroll records • Travel records • Vouchers for payments to vendors, employees, etc.
<p>Keep forever:</p>	<ul style="list-style-type: none"> • Bills of sale • Audit reports • Cancelled checks • Deeds and titles • Asset and depreciation schedules • Year-end financial statements • Legal records • Minutes of meetings • By-laws and utility paperwork • Property records • Retirement records

➤ Financial Tasks to be Handled at the End of the Fiscal Year

Create Year-End Financial Statements

Please refer to Chapter 5: Income Statement and Chapter 6: Balance Sheet for instructions on creating these reports.

File the Annual PCE Report

Please refer to Chapter 24: Annual PCE Report for details on this process.

Create a New Budget

Please refer to Chapter 3: Creating a Budget for tips and instructions.



➤ A Word to the Wise: Frequent Turnover

One of the biggest problems in rural utilities is frequent turnover of the clerks. Frequently losing a clerk can send a utility into chaos.

It is the clerk that keeps the money coming into the utility by sending out utility invoices each month. When a clerk leaves, there is no one to train the new one. If the customer invoices are not sent out for even one month, this can result in a big problem for a utility with limited cash flow. If the new clerk does not know how to log payments for customer accounts and the invoices go out with errors, the customers will rapidly lose confidence in the utility and stop making payments.

Make sure you know all of the passwords to the accounting software, the Electronic Federal Taxpayer's System website, and combinations to the safe.

Losing a clerk can be one of the biggest problems a utility will face. What can you do?

Tips and Suggestions to Reduce Employee Turnover



- Sit down with your clerk and explain to them how valuable they are to the utility—explain to them their role in keeping the utility afloat by sending out utility invoices and keeping the customer accounts in order
- Check in with your clerk and ask them if their job is going well



- Treat all of your employees with respect
- Ask them to give the utility notice if they are thinking of leaving so that training can occur ahead of time with a new clerk



- Pay them what they are worth
- Create a nice work environment



- Acknowledge and reward hard work
- Help your clerk be successful by offering them training and other work resources

Chapter 3: Creating a Budget

Section Contents:

Estimating Expenses

Estimating Income

Accrual versus Cash Basis

Putting it all Together

Amending the Budget

Review, Revise, and Repeat

A budget is a yearly plan for your money. A budget tries to predict how much money will come into the utility and how much will go out. A budget also tries to predict where the money will come from and where the money will be spent. It is a great time for the manager to sit down and carefully look at all of the finances for the electric utility. This is an exercise that might take some extra effort the first time it is done, but it will become easier every time and the benefits will pay off tenfold over time.

All electric utilities should create an annual budget. It is the manager's job to create this. It should be a team effort with the clerk or bookkeeper because they have all of the numbers available in QuickBooks. The operations personnel should also be consulted because they know the condition of the equipment in the power plant and will have valuable information regarding upcoming expenses. **Whenever the utility spends money, it should consult the budget and make sure the expense fits within the budget.** This will help control utility expenses.

A good budget will predict:

- How much the utility will spend for each one of their expense categories
- Upcoming major expenses which may require additional funding
- The amount of money your electric customers will pay based on the electric rate
- Any other income your utility is expecting to receive
- The amount of grant money the utility will receive
- Whether there will be a profit or a loss in the budget year



Tip: *If a utility has not recently created a budget, or if there is a new manager and no one knows where to start, have the employee using the accounting software print out an Income Statement for the current fiscal year (see Chapter 4: Income Statement for a further discussion of this topic).*

If you have concerns about the accuracy of the accounting records, there are other ways to verify income and expense data:

- *Look for a copy of last year's budget and use it as a guide*
- *Call some vendors and obtain yearly data---what did you spend on fuel?*
- *If your bank statements have check images, examine them for income and expense information*
- *Look at your monthly PCE UMR reports*

You may have to play detective to get your income and expense data but there is a way and it will be worth the effort.

➤ Estimating Expenses

Estimating expenses can be an overwhelming exercise for a utility. When you start thinking of the price of fuel and how much fuel a utility needs and add to that the repairs necessary to keep the gensets running... Let's just say, this has caused more than one utility manager to lose sleep. Try to remember that you are doing an important task by creating this budget, and that your best guess is far better than no guess at all. When you start to predict next year's expenses, group the predictions like they are grouped on the Income Statement.

Personnel Expenses

To estimate next year's payroll expenses, start out by looking at the cost of all of your employees for the current year. Be sure to include wages as well as employer's payroll taxes and workers' compensation insurance.

Personnel Expenses	
Wages – Total Compensation	\$222,160.00
Employer Portion of Payroll Taxes	\$20,870.00
Workers' Compensation	\$7,001.00
Total Personnel Expenses	\$250,031.00

When thinking about your employees for the upcoming year, ask yourself some questions:

- Do you need all of your employees?
- Do you pay any overtime? If yes, can you avoid overtime by adding another employee?
- Can you reduce the hours of any of your employees and not harm the utility?

This can be a balancing act because the utility needs enough employees to run the power plant. The salaries also need to be a wage high enough for an employee to live on and for the utility to attract skilled people. These can be hard issues to face, but sometimes decisions need to be made for the health of the utility and the ability to provide power to your community.

Operating and Maintenance (O&M) Expenses

It is very important that you give this group of expenses a lot of thought. Fuel will likely be your biggest line item. Ordering fuel can be a juggling act. How often can you get a delivery of fuel? How much fuel does your utility use? See Chapter 16: Inventory for a discussion on fuel.

The cost of oil, filters, small tools and parts can be predicted by using your inventory spreadsheet. See the Chapter 16: Inventory for more details on this topic. The big items include any expensive tools the utility needs, or any repairs and/or overhauls that the

engines or other major equipment will be needing. Look at your inspection sheets. Will any of the utility's equipment be nearing the number of hours to indicate repair and/or replacement?

Operating and Maintenance (O&M) Expenses	
Fuel Expense	\$183,115.00
Purchased Power	\$38,948.00
Generator Oil	\$2,423.00
Filters	\$3,155.00
Generator Repairs/Maintenance (Parts and Freight)	\$13,750.00
Tools	\$4,500.00
Equipment Rental	\$1,200.00
Other (See Schedule A)	\$5,881.00
Total Operating Expenses	\$252,972.00

General and Administrative (G&A) Expenses

Look at the current Income Statement and examine each account in this section. Are there any conferences or trainings coming up that any of your employees should attend? Do you have enough postage and office supplies? Freight and shipping is a big expense in rural Alaska. Have you included it and estimated it accurately? Are any outside consultants scheduled to come to the utility to perform an audit or to train? Do you expect the price of your materials and items like travel to stay constant, or are they likely to increase in the coming year?

General and Administrative (G&A) Expenses	
Outside Professional Services	\$14,935.00
Insurance	\$10,701.00
Office Supplies	\$7,095.00
Postage	\$1,301.00
Office Rent	-
Travel	\$5,000.00
Training	\$2,800.00
Bad Debt Expense	\$890.00
RCA Fees	\$39.00
Other (See Schedule A)	\$15,485.00
Total General and Administrative	\$58,246.00

➤ Accrual vs. Cash Basis

There are two methods of accounting known as the Accrual Basis and the Cash Basis. They differ by when they recognize income and expenses.

Accrual

The accrual method recognizes income when it is earned and when the expenses are committed. Thinking about the electric company, this means that when the invoices are sent out at the beginning of the month, the income is recognized on that day before the invoices have actually been paid. When you pick up the telephone and order fuel and then enter the bill, the expense is recognized even though you have not written a check and paid for it.

Cash

The cash method recognizes the income when it is actually received and the expense when the check is written to pay for it.

QuickBooks has a way of switching back and forth so that the Income Statement can be quickly viewed in the Cash Basis or the Accrual Basis. Why does this matter? Some electric utilities (and some businesses) are lucky and they have good cash flow. This means their customers pay on time soon after they receive their invoice which provides money so the utility can pay their bills when the vendor sends them. Other utilities have a shortage of cash. They may have trouble getting their customers to pay their electric bills. Maybe some customers don't pay at all. This problem makes it hard for the utility to pay their vendor bills.

When creating budgets, it becomes very important to be able to predict cash flow. If you send out invoices totaling \$30,000.00, how much of this money comes back in a timely fashion? How much of it comes back at all? When you are reporting on income whether it be for a budget or a PCE report, it is important that you know if your total income figures on the Income Statement are in the cash basis (this income was actually received) or in the accrual basis (this is the total income invoiced, but you have no idea what was received).

➤ Estimating Income

If you do have confidence in your Income Statement start at the top. The income accounts report on the electric income coming in from residents, community facilities, commercial and federal/state groups. They also report on other income such as grants and fees you charge, such as pole rental.

If you use QuickBooks, look at the Income Statement in the cash basis if you have a collections problem. It will more accurately predict your cash situation. If your clerk uses customer ledgers in your spreadsheet program, there will probably be a column on electric payments collected. Sit down with your clerk and go through all of your electric customers. Estimate the yearly income you will receive from each one. If a customer has passed or has left the community, do not count their income. Group your sources of electric income by category: residential, commercial, community facility, state/federal. Add up all this income.

Utility Operating Income	
Sales Revenue	
Residential	\$269,161.00
Commercial	\$226,326.00
Community Facilities	\$32,094.00
Federal/State Facilities	\$7,204.00
TOTAL Sales Income	\$534,785.00
Other Incomes	
Grants	
Pole Rentals	
Waste Heat In-kind	
Other (See Schedule A)	\$93,109.00
Total Operating Income	\$627,894.00

The utility must make sure that it brings in enough income to cover expenses. If the utility loses money, eventually it won't be able to pay employees, buy necessary parts and materials, and it may have to rely on outside help. Luckily, the utility's income is not set in stone. **By changing customer rates, the utility can change how much income it gets.** If utility expenses go up or utility sales go down, it will likely need to raise rates. At the very least, a utility should evaluate customer rates when new fuel shipments are received and when the PCE annual report is submitted to the RCA (See Chapter 24: Annual PCE Report). While

no one wants to raise customer rates, it may be the only way that a utility can be sustainable. Please see Chapter 11: Setting Rates for more information.

The utility should also look into other sources of revenue—pole rentals, grants, waste heat, etc.—to see if there might be other ways to help pay for utility expenses. If someone is using **utility property or is getting benefits from utility assets**, make sure you are charging them for the benefits that they are receiving!

➤ Putting it all Together

In the preceding example:

Total Income	\$627,894.00
<hr/>	
Total Expenses	\$561,249.00
<hr/>	
Net Income	\$ 66,645.00

After looking at every income and expense account and making a prediction for the upcoming year, enter your numbers on your budget sheet. The budget sheet should have the same income and expense accounts as your chart of accounts. Total up all of your income accounts and total up your expense accounts. Your goal is to have a balanced budget. This means your income equals your expenses. And if you have a surplus (more income), that's even better.

At first glance, you might think that the above surplus of \$66,645.00 is great news. It is certainly good that there is more income than expenses, but there are other things to consider.

- How much does the utility actually have in their checking and savings accounts at the end of the year? This is called the **Prior Year Cash Balance** and there is a spot for this at the top of your budget.
- Does the utility have vendor bills in the office from the current year that will have to be paid in the budget year?
- Are there any outstanding loan payments from the current year that will have to be paid in the budget year?

- Are there any major purchases or repairs (such as an engine) that the utility will have to make in the budget year?
- If there is a surplus, maybe this is a good time to revisit your electric rates.

Before the budget is finalized, have the utility's governing body must approve it. They may have suggestions. They may also have information that the utility manager does not have.



- **Tip:** *When the budget is approved, don't just file it away and forget about it. Use it as a financial map for your electric utility all year long. Each month, after the bank accounts are reconciled and all of the accounting information is entered into QuickBooks, the utility clerk should enter the actual figures into a budgeting spreadsheet. This spreadsheet will track year-to-date expenses and also the differences between the budgeted and the actual numbers. It is also a great idea to review your electric rates after completing the budget process. Make sure the rates are realistic. See Chapter 11: Setting Rates for more information on this topic.*

➤ Amending the Budget

As the year goes forward, you can see how good your predictions are. If at any point in the year you realize that your prediction was wildly off, don't ignore it. The budget should be one way that the utility authorizes money to be spent: **Do not spend money if it hasn't been authorized!** If you had something expensive and unexpected occur, you will have to figure out a way to cover it because it was not in the budget. A **Budget Amendment** is used to revise the working budget to reflect changes that occur throughout the fiscal year. Once the working budget is completed, it can only be changed with a Budget Amendment. The Budget Amendment will have to be created and presented to the governing board for approval. The amendment should describe in detail the following:

- What is the change?
- Why is the change necessary?
- Cost estimates for the change should be provided.
- When are the funds required?

➤ Review, Revise and Repeat

A budget is key to running a complex operation like a utility. Using a budget will result in increased profits from one year to the next, reduced stress and fewer crises due to unplanned expenses. Budgets will result with improved relationships with each of the following groups of people:

- Utility clerk
- Governing body
- State of Alaska
- Grant agencies

Remember, your electric utility services your entire community. They are all depending upon you.

Chapter 4: Income (Profit & Loss) Statement

Section Contents:

What You Can Learn from an Income Statement

Parts of an Income Statement

Types of Income

Expenses

Things to Watch Out for on Your Income Statement

Example Utility Income Statement

One of the main reports created and used by all businesses is the Income Statement (also called the Profit and Loss Statement). An Income Statement summarizes all of the income and expenses in the utility for a specific period of time. The most common time periods are a month, quarter, calendar year or fiscal year. A calendar year runs from January 1 – December 31. A fiscal year matches your budget year.

Your utility may have a fiscal year of July 1 through June 30 or October 1 through September 30.

➤ What You Can Learn from an Income Statement

- What is your utility's profit or loss for any period of time?
- What are your highest expenses?
- Is your utility's profit enough to set aside money for emergencies and future repairs?
- Are you collecting enough income to cover your expenses?

Net Operating Income

There is a mathematical sentence that applies to the Income Statement:

$$\text{Income} - \text{Expenses} = \text{Profit or Loss}$$

A positive income means that the utility made money during the reporting period, whereas a negative number means that the utility lost money. If a utility has a negative operating income for too many months or years, the utility could have serious issues and go into bankruptcy.

The net operating income is the profit or loss made in the reporting period. A profit tells the manager how much additional money could be available for utility investments. A loss could be a signal that rates need to be increased.

At the end of each month, the clerk should create the Income Statement. Before doing this, however, make sure that:

- All of the bank accounts have been reconciled
- The cash in the safe is reconciled
- All vendor bills are entered in the accounting system
- All checks being held in the office are deposited

➤ Parts of an Income Statement

There are four basic parts to an Income Statement:

1. Heading
2. The Income Section
3. The Expense Section
4. The Bottom Line

The Heading

Since this is a formal statement, there is a standard heading which has three lines. The first line is the name of your utility. The second line is the name of the report. The third line is the time period covered by the report.

Following is a sample heading:

Salmon River Electric Utility
Income Statement
For the month ended June 30, 20XX

The Income Section

The Income Section starts with an income heading and then will list all the income accounts in the Chart of Accounts. The number next to each income account will be the total for the time period that the statement includes.

INCOME STATEMENT	
Utility Operating Income	
Sales Revenues	
Residential	\$269,161.00
Commercial	\$226,326.00
Community Facilities	\$32,094.00
Federal/State Facilities	\$7,204.00
<i>TOTAL Sales Revenue</i>	<u>\$534,785.00</u>
Other Revenues	
Grants	-
Pole Rentals	-
Wasteheat In-kind	-
Other (See Schedule A)	\$93,109.00
<i>TOTAL Operating Income</i>	<u>\$93,109.00</u>
TOTAL INCOME (Sales Revenue + Operating Income)	<u>\$627,894.00</u>

➤ Types of Income

Sales Revenue

The income on the Income Statement is income that primarily comes from electricity sales to customers. All utilities must have rates for each class of customer (residential, commercial, community facilities, federal/state facilities). Some utilities have a single rate for all kilowatt-hours sold in the community, whereas others may have numerous rate classes. No matter how a utility chooses to structure the rates, it is important that the utility ensure that customers are being charged properly. If the customer and billing system is not set up properly, the utility will not be charging customers properly and the income collected by the utility will be incorrect.

The RCA separates electric income into four classes; it is not required that there are different rates for each customer class, but the rates for each class should be consistent with the cost of producing and delivering power to each of the customer classes.

The number of kWh sold for each class is not reported to the RCA on the Income Statement in the annual report. Only the income is reported. The kWh sales by class must be reported to AEA on a monthly basis in the UMR Report.

Other Types of Revenue

Penalties

When customers fail to pay a bill on time, they can be charged a penalty. It costs money for the utility to recover these late payments.

Customer Charge

If customers are charged a monthly fee, the customer charge should be in the income section.

Connect/Disconnect Fees, Other Special

Electric utilities often provide additional services to customers such as service hook-ups or disconnects, and meter replacements. The costs of providing these services are recovered through service charges.

Other Income

Some utilities receive significant income from other sources besides sales of electricity. Grants, pole rentals, and waste heat sales are examples of other income sources which are common across PCE-eligible communities.

Grants

Grants can come from a number of sources: the city, tribal, state and/or federal government, foundations, non-governmental organizations (NGOs), or other sources. When a utility receives a grant, the grantor does not expect a service or good in return for providing the grant. A grant can be provided to a utility as an operational or capital

grant. Grant funding cannot be depreciated. If the utility pays a portion of the project, this portion can be depreciated.

Pole Rentals

Pole Rentals are often used for the use of electric poles. These are primarily for telephone wires.

Waste Heat In-Kind

Waste Heat In-Kind is the value of a sales agreement for delivering excess heat from the power house's heat recovery system to heat buildings. Heat recovery systems are generally quite cost effective, and income from the system both reduces the amount of rate income needed and provides an incentive for the utility to maintain the system. Remember, that if income is being reported for the heat recovery system, the operational expenses also need to be reported.

Other (See Schedule A)

Other (Schedule A) includes all other utility income sources and should be included on Page 4A of the annual report. A common 'other' utility income source is fuel sales. If fuel sales are part of a utility's owner's line of business (such as a tribe that owns the utility and the local fuel dispensary), the fuel sales should be separated from the utility accounts and the fuel should not be reported to the PCE program.

Total Operating Income

Total Operating Income is the sum of all the Operating Income.

➤ Expenses

The Expense Section will start with an Expense Heading and will list all the expense accounts in the Chart of Accounts. These balances will include the totals for the period in the report.

Utility Expenses	
Personnel Expenses:	
Total Compensation During Test Period	\$222,160.00
Employer Portion of Payroll Taxes	\$20,870.00
Workers' Compensation	\$7,001.00
<i>TOTAL Personnel Expenses</i>	<u>\$250,031.00</u>
Operating Expenses:	
Fuel Expense	\$183,115.00
Purchased Power	\$38,948.00
Generator Oil	\$2,423.00
Generator Filters	\$3,155.00
Generator Repairs/Maintenance (Parts and Freight)	\$13,750.00
Tools	-
Equipment Rental	-
Other (See Schedule A)	\$5,881.00
<i>TOTAL Operating Expenses:</i>	<u>\$247,272.00</u>
General and Administrative Expenses:	
Outside Professional Services	\$14,935.00
Insurance	\$10,701.00
Office Supplies	\$7,095.00
Postage	\$1,301.00
Office Rent	-
Travel	\$27,458.00
Training	-
Bad Debt Expense	-
RCA Fees	\$39.00
Other (See Schedule A)	\$15,485.00
<i>TOTAL General and Administrative</i>	<u>\$77,014.00</u>
TOTAL EXPENSES (Personnel + Operating + G&A)	<u>\$574,317.00</u>

Personnel Expenses

Personnel expenses include all expenses associated with the people directly employed by the utility. A utility has three general functions that frequently require staff time: management, financial, and operations. Utility managers are ultimately responsible for ensuring the financial and operational health of the utility. Utility clerks generally bill customers and fill out the monthly PCE forms submitted to AEA. The operators run the powerhouse, perform maintenance, and ensure that the utility provides stable and reliable power to customers. Depending on the size of the utility, each position may require only a part-time employee, whereas other utilities may require multiple people to fulfill each function.

If the utility is part of a larger organization, either the city or tribal government, and personnel serve multiple functions in the organization, such as the utility clerk also acting as the city clerk, personnel time should be divided accurately for all functions.

All utility personnel functions should be paid for by utility income. The one exception is for city-owned utilities that allocate staff time. For example, if the same person is the utility clerk and city clerk, the city-owned utility can count, or allocate, a portion of the clerk's time to the utility.

Total Compensation

The "Total Compensation" line item includes all salaries and fringe benefits for all employees. Fringe benefits include medical insurance, retirement plans, the value of rent if housing is supplied, and meals. If other people are hired to do work that are not employees, their expense should be included under Operating Expenses or General and Administrative Expenses, depending on the nature of the work performed.

Employer Portion of Payroll Taxes

This line item includes only the portion of FICA (Social Security), Medicare, and Alaska unemployment tax that is required by the employer. The employees' contributions are not included since it comes from their wages.



The three taxes employers are responsible for are:

1. FICA tax (or Social Security) is 6.2% of gross wages.
2. Medicare is 1.45% of gross wages.
3. Alaska unemployment tax (or Employment Security Tax) is the amount established by the State of Alaska. See Chapter 2: Utility Financial Tasks for a discussion on the Alaska Unemployment tax.

Workers' Compensation

Workers' Compensation Insurance is required by state law. A utility can get workers' compensation insurance from private insurers or be self-insured. The utility should encourage all employees to promptly report any job-related injuries and illnesses. Prompt reporting can limit liability for the utility.

Total Personnel Expenses

Total Personnel Expenses equals the sum of all of the line items under the Personnel Expenses section (Total Compensation + Employer Portion of Payroll taxes + Worker Compensation).

Operating & Maintenance (O&M) Expenses

Operating expenses include items and activities that are necessary to ensure the long-term, on-going operation of the utility. Operations & Maintenance costs are expenses that are actually related to operating and maintaining the electric utility.

Fuel Expense

Fuel Expense is the largest single expense for most utilities. The fuel expense is driven by both the unit cost of the fuel and the number of gallons consumed over the year. It is important that the utility tracks the cost per gallon, the number of gallons purchased and the number of kWh per gallon.

$$\text{Fuel expense} = \text{Price per gallon} \times \text{Number of gallons}$$

The total yearly cost of the fuel is included on the Income Statement under "Fuel Expense" in the annual PCE report, but the number of gallons consumed per month is also reported on Page 5 of the Annual Report. If a utility needs assistance getting a loan for bulk fuel,

the State of Alaska's Division of Community and Regional Affairs' Bulk Fuel Loan Program is available.¹ If a utility has overdue fuel loans, expenses associated with this are not eligible for PCE reimbursement.

Purchased Power

Purchased Power is reported if the utility purchases power from an independent power producer (IPP) or other power supplier. For unregulated utilities, it is the responsibility of the utility manager and governing board to ensure that the utility customers are paying a fair price for the purchased power. For the purpose of the PCE program, a utility is required to report the amount and cost of purchased power monthly to AEA and annually to the RCA. The RCA maintains the right to investigate and determine if the purchased power expense is fair and can determine how much of the expense will count towards the PCE level set by the RCA.

Purchased power is also reported on Page 5 of the PCE Annual Report and on the Non-regulated PCE Fuel and Purchased Power Cost Report Form.

Generator [Engine] Oil

This line item also includes the cost of lubricants needed for the engine. The exact schedule for the oil changes is based on each manufacturer's specifications, but for most engines it is between 250-1000 hours of runtime between changes. This means if an engine is run 24 hours a day the oil would need to be changed every 10-40 days.

Engine Filters

This includes oil filters for the engine, which are replaced on the same schedule as oil changes, and various other filters required for the engine including: fuel filters, air filters, filters in the coolant system, etc.

Generator [Engine] Repairs/Maintenance (Parts and Freight)

This line item includes routine maintenance expenses that do not extend the life or change the value of the engine and generator. Routine maintenance expenses include oil and

¹ <https://www.commerce.alaska.gov/web/dcra/BulkFuelLoanProgram.aspx>

filters, coolants, belts, and hoses. Expenses for repairs to the distribution system can be included here or under Page 4A ("Other Operating Expenses").

The utility should also keep track of all repairs and maintenance expenses not paid for by the utility, including AEA's Circuit Rider program. Although these will not be reported to the RCA for reimbursement through the PCE program, since they are not expenses incurred by the utility, these external services should still be accounted for by the utility, so that the utility management has a true picture of the total cost of running the utility. In order to budget for the future, the utility needs to know all current and past costs for providing utility services. The utility may need to be able to pay for those services through ratepayers if they are not available through state or federal programs.

Tools

This category is for hand tools and power tools. As explained in Chapter 1: Chart of Accounts, it is suggested that a utility have one expense account for expensive tools and another expense account for inexpensive tools. The RCA looks at expenses both under and over \$500. If you separate your tool expenses into two accounts (one for tools greater than \$500 and one for tools less than \$500), when it is time to create the RCA annual report it will be very easy to locate purchases for tools (greater than \$500) that will get depreciated.

It is also recommended to create an expense account for each generator in your utility: for example, Generator 1, Generator 2 and Generator 3 expense accounts if you have three generators. You will use these to track generator repairs and/or overhauls greater than \$500. This will help in several ways. You will readily be able to see which generator (if any) is receiving repairs/overhauls. Expenses in these accounts will probably be allowed by RCA as depreciable and there will be no searching for these items at the end of the year. Any labor, travel and parts associated with these repairs/overhauls should be included in the specific generator account.

Equipment Rental

This expense category includes all equipment that is rented to perform utility day-to-day tasks. If equipment is rented to perform work for capital projects, those expenses should be included in the project's capital cost and included under "Depreciation Expenses".

Other

Operational expenses categorized as Other are included on Form 4A of the Annual Power Cost Equalization Report for Unregulated Utilities. Depending on the choices made by the utility, other expenses can include costs for the distribution system, renewable energy systems, metering, etc.

Total Operating Expenses

This line equals the sum of all of the line items under the Operating Expenses section (Fuel Expense, Purchased Power, Generator Oil, Generator Filters, Generator Repairs/Maintenance, Tools, Equipment Rental, Other).

General and Administrative (G&A) Expenses

In addition to the Operating & Maintenance costs, an electric utility must perform work in order to provide the financial, regulatory, and legal management of the utility. General & Administrative costs include office expenses for billing customers, insurance, office supplies, bad debt, interest on loans, and insurance.

Outside Professional Services

This category includes services that do not directly support the generation and distribution of electricity. Depending on the needs of the utility, these services can include auditors, legal services, bookkeepers, consultants that compiled the PCE Annual Report, and other "office workers".

Insurance

Although insurance is not required by any state or federal agencies, except as a condition for a loan, **the utility should carry liability and property insurance to protect itself and its assets** from unforeseen events.

Liability insurance protects the utility from lawsuits that arise from various utility activities.

General Liability protects the business from the cost of failure to major facilities, such as transmission lines and storage tanks, and from suits arising from accidents that occur to individuals who are injured as a result of entering an unsafe area that is owned or controlled by the business, such as falling from the top of a powerhouse.

Directors & Officers Insurance protects the policy-making body and the staff from malpractice suits, including employment lawsuits. Additional liability insurance can be purchased for other specific needs and/or extend the amount of coverage.

Property and Casualty Insurance can be purchased to protect the utility's property, including grant-funded property, from fire, theft/vandalism, and water damage. The utility can also be protected against the cost of unexpected equipment breakdowns. The utility's insurance premiums will reflect the value of the utility's property and an analysis of the risk.

Since it is in the insurance company's best interest to limit their exposure to risk, many insurance companies have personnel specifically tasked with providing risk assessments to their policyholders. **The recommendations provided to the utility can be a valuable tool from a disinterested third-party to identify potential improvements to the utility.**

Adequate insurance benefits the utility by reducing the need for a reserve account to cover unexpected events. For instance, instead of having a reserve account with sufficient funds to cover an unexpected breakdown of an engine (\$100,000 or more), insurance can be purchased to assist with these potential issues. Obviously, there will be conditions and events, such as negligence, that will not be covered by an insurance policy.

Office Supplies

This category includes common supplies such as paper and pens as well as more specific supplies such as preprinted letterhead and envelopes, checks for the various bank accounts, and forms or booklets. A utility could also choose to include other lower-cost items such as printers, computers, scanners, and faxes, under office supplies.

Postage

This includes the cost of stamps and also freight. Be sure not to double count freight expenses associated with Operational Expenses, all expenses should only be counted once.

Travel

These expenses may be incurred both for employees (full or part-time paid workers) and utility officials (board and/or council). Travel expenses include the direct cost of transportation, per diem, lodging, and other. This includes airfare, automobile mileage allowances, taxis and any other form of essential transportation expense incurred on official business. Per diem is paid to an employee or official to cover the cost of lodging and meals. Lodging is backed up with receipts, and meals are usually a flat rate. Other charges may include telephone, parking fees (not parking tickets), emergency purchases of supplies, and other charges to complete official business.

Training

Training expenses are those associated with training utility personnel to perform their jobs. If the utility did not pay for the entire cost of training (as may be the case for AEA-sponsored power plant operator or bookkeeper training), only the expense that the utility paid will be an eligible expense when being reported to the RCA. Conference fees are also included.

If the training is associated with bringing a new asset into service, such as a newly installed wind turbine or a new make of engine, and specialized training is needed to ensure the safe and efficient operation of the asset, the training can be added to the capital cost of the asset and included under "Depreciation Expenses".

Bad Debt Expenses

This category can be confusing. The bad debts are not the utility's debts. They are **the unpaid and uncollected customer bills** that the utility has written off and does not expect to collect. The bad debt expense line item spreads the **unrecovered income** over all the utility customers.

Prior to writing off bad debt expenses, a utility should **have an internal policy** about how to decide that a debt is not expected to be collected. The policy could be a set period

(generally 12-18 months) or some other factor. The DCRA has an excellent guide, written for water and wastewater utilities, that gives guidelines on how to improve a utility's bill collection rate.¹

Bad debt expenses are included in the income statement as a way to account for collection rates that are less than 100%. Reporting bad debt also allows the utility to recover the expense through customer rates and is a reimbursable expense for setting the PCE rate.

RCA Fees

This includes a number of fees required by the RCA. Fees are charged when utilities submit a fuel report (\$39), request a rate change (\$39), or request a change in the fuel surcharge (\$39). A fee is also levied when the RCA analyzes the Annual Power Cost Equalization Report for Nonregulated utilities in order to recalculate the PCE level (\$471). This is done approximately every three years or at the utility's request.

Other General and Administrative Expenses

General and Administrative expenses categorized as Other should be included on Form 4A of the Annual Power Cost Equalization Report for Unregulated Utilities under "G&A Expenses".

Other expenses include:

1. Utilities, internet, and phone for the office and/or powerhouse
2. Stipends for officials, board members, or council members for utility activities.
3. Meeting fees such as facility rentals, teleconference charges, etc. Note that if travel for a meeting is requested, the expense should go under the travel line item.

If the expense is not related to the function of the utility, such as scholarship funds, donations, and other charitable activities, the expenses will not be counted as an eligible expense by the RCA. The utility and governing body decide if the ineligible activities are

¹

<https://www.commerce.alaska.gov/web/Portals/4/pub/Utility%20Collections%20Handbook.pdf?ver=2016-10-07-112921-043>

important functions for the utility to continue supporting as the program would come out of utility profit.

Total General and Administrative Expenses

This line sums up all of the line items under the General and Administrative section: Outside Professional Services, Insurance, Office Supplies, Postage, Travel, Training, Bad Debt, RCA fees, and Other G&A expenses.

Other Expenses

Interest Expense

This line item includes the amount of interest paid in a given year for loans. It is the cost of borrowing money. The interest paid is reimbursable by the PCE program. The most common loans that rural Alaska utilities hold are for bulk fuel purchases, but a number of utilities have loans through AEA's Power Project Loan Fund or various USDA programs. If the interest payments on a capital loan start prior to the project being put into service, the interest payments should be included in the capital cost and depreciated.

Depreciation Expense

As discussed in Chapter 6, Depreciation is an accounting method to estimate the loss of an asset's value over time. An asset is something that has value that will be used to generate income for the utility in the future. Common utility assets include engines and generators, meters and transformers, computers and other office equipment. Improvements to assets, especially engine overhauls, which increase the life or performance of the asset, can also be included under depreciation.

Depreciation Expense = Purchase Price of Asset divided by Useful Life of Asset

For example: Laptop Purchase Price = **\$2,000** Useful Life = **5 years**
 $\$2,000 / 5 = \400

This laptop will lose \$400.00 of its value each year.

Depreciation Expense = \$400

The Bottom Line

The bottom line will be labeled **Net Income**. It is calculated by subtracting the total of all the expenses from the total of all the income. The resulting number will be the profit or loss of the utility over the period listed in the heading of the report. When this information comes together in this report, anyone will be able to look at it and see if the utility can cover its day-to-day expenses with the incoming money. Any profit in the bottom line increases the equity of the utility. A loss decreases equity.

$$\text{Total Income minus Total Expenses} = \text{Profit or Loss}$$

➤ Things to Watch Out for on your Income Statement

- There should be no negative numbers on the Income Statement
- Look through each number on this report and ask yourself if the numbers make sense
- If your utility has a loss, what is causing it? Can you do anything to lower your expenses? Can your income be increased?
- Are your residents paying their electric bills?

In most cases, a utility should expect that the income and expenses are fairly consistent from month to month and year to year. Utility managers will see differences in fuel usage from summer to winter, but these differences should be similar from year to year. Any unexpected changes in income or expenses should be investigated. Fuel expense will most likely be the most variable and hard to predict expense because of the changing cost of fuel.

The Regulatory Commission of Alaska wants utilities to remove their high dollar expenses for tools, equipment and generator repairs from their expense accounts and record them as assets which will be depreciated. **The depreciation on all of the assets will appear on the Income Statement as an expense.** There is an entire section on Depreciation in Chapter 6 and also more discussion in the section on Balance Sheets in Chapter 5.

Following is the Income Statement in the Annual Power Cost Equalization Report required by the Regulatory Commission of Alaska. Notice that the income and expense accounts are the same as the suggested Chart of Accounts in Chapter 1, except for a few differences in the expense accounts.

➤ Example Utility Income Statement

INCOME STATEMENT	
Utility Operating Income	
Sales Revenues	
Residential	\$269,161.00
Commercial	\$226,326.00
Community Facilities	\$32,094.00
Federal/State Facilities	\$7,204.00
<i>TOTAL Sales Revenue</i>	<u>\$534,785.00</u>
Other Revenues	
Grants	-
Pole Rentals	-
Wasteheat In-kind	-
Other (See Schedule A)	\$93,109.00
<i>TOTAL Operating Income</i>	<u>\$93,109.00</u>
TOTAL INCOME (Sales Revenue + Operating Income)	<u>\$627,894.00</u>
Utility Expenses	
Personnel Expenses:	
Total Compensation During Test Period	\$222,160.00
Employer Portion of Payroll Taxes	\$20,870.00
Workers' Compensation	\$7,001.00
<i>TOTAL Personnel Expenses</i>	<u>\$250,031.00</u>
Operating Expenses:	
Fuel Expense	\$183,115.00
Purchased Power	\$38,948.00
Generator Oil	\$2,423.00
Generator Filters	\$3,155.00
Generator Repairs/Maintenance (Parts and Freight)	\$13,750.00
Tools	-
Equipment Rental	-
Other (See Schedule A)	\$5,881.00
<i>TOTAL Operating Expenses:</i>	<u>\$247,272.00</u>
General and Administrative Expenses:	
Outside Professional Services	\$14,935.00
Insurance	\$10,701.00
Office Supplies	\$7,095.00
Postage	\$1,301.00
Office Rent	-
Travel	\$27,458.00
Training	-
Bad Debt Expense	-
RCA Fees	\$39.00
Other (See Schedule A)	\$15,485.00
<i>TOTAL General and Administrative</i>	<u>\$77,014.00</u>
TOTAL EXPENSES (Personnel + Operating + G&A)	<u>\$574,317.00</u>
BOTTOM LINE (Income - Expenses)	<u>\$53,577.00</u>



Tip: *Whenever the utility has to make a large repair or utility purchase, file the vendor invoices so they can be easily found. Copies of these invoices will have to be sent into the Regulatory Commission with the annual PCE report at the end of the year. Include all of the invoices relating to the expense- subcontractor labor, freight, subcontractor travel expenses, parts and supplies.*

Chapter 5: The Balance Sheet

Section Contents:

What You Can Learn from the Balance Sheet

Parts of the Balance Sheet:

Example Balance Sheet for the Regulatory Commission of Alaska

Things to Look at on your Balance Sheet

Inventory of Assets

The balance sheet is the first very important financial statement. This report is a snapshot of the health of your utility at one point in time. A Balance Sheet summarizes all of the assets, liabilities and equity accounts and reports their totals as of a specific date. The date of your Balance Sheet should match the **ending date** of your Profit & Loss Statement so that all of the numbers will belong to the same period of time for both statements.

For example: If your Income Statement date is for the month of:

June 1 through June 30, 20XX

The Balance Sheet date should be June 30, 20XX

At the end of each month, you should create your Balance Sheet. Before doing this, make sure that:

- All of the bank accounts have been reconciled
- The cash in the safe is reconciled
- All checks being held in the office are deposited



➤ What You Can Learn from the Balance Sheet

A Balance Sheet answers the following questions:

- What is the **value** of everything the utility owns?
- How much money does the **utility owe** to others?
- How much money do **others owe** the utility?
- Can the utility pay off its **debt**?
- Can the utility afford to buy new **assets**?
- Is the utility paying their **payroll taxes**?
- Are the **residents** paying their electric bills?
- What is the value of the **fuel** in the storage tanks?
- How much **cash** is in the safe?
- How much do the electric **customers owe** the utility?
- What is the balance of the utility's **credit card**?
- Does the utility have any other **loans**?

The answers to all of these smaller questions add up to the answer of the biggest question facing the electric utility:

Is the utility sustainable? Does it have the financial health to continue?

➤ Parts of the Balance Sheet

What follows is a generic look at what should be included in a balance sheet. For more information about the balance sheet included in the PCE Annual Report, please refer to Chapter 24: Annual PCE Report.

There are four basic parts of a balance sheet, each described below:

1. Heading
2. The Asset Section
3. The Liability Section

4. The Equity Section

Heading

The **heading** of a balance sheet includes the name of the electric utility, the name of the report and the date of the report. The date of the balance sheet is one day---not a period such as a month or a year. The Balance sheet is a snapshot of your utility's net worth on a specific day. Below is a sample heading:

**Salmon River Utility
Balance Sheet
As of June 30, 20XX**

Asset Section

The **asset section** of the report is divided into Current Assets and Fixed Assets. The asset section lists checking and savings accounts, the money that other people owe the utility (accounts receivable) and all of the equipment that the utility owns. The balances in these accounts will be the balance as of the date of the report. This section will always have a total appearing at the end labeled **Total Assets**.

ASSETS	
Current Assets	
First National Checking Account	\$30,000.00
First National Savings Account	\$15,000.00
Safe	\$5,200.00
Employee Advances	\$300.00
Electric Accounts Receivable	\$10,000.00
Fuel in Tanks	\$10,000.00
Total Current Assets	\$70,500.00
Fixed Assets	
Office Equipment	\$5,000.00
TOTAL ASSETS	\$75,500.00

Liabilities Section

The **liabilities section** will list the utility's liabilities (loans and other money owed others). It will start with Current Liabilities (debt that will be paid off in less than one year). Current Liabilities includes Payroll Liabilities, Credit Cards and Accounts Payable (vendor debt). Long-term liabilities (debt paid off in more than one year) will follow. If the utility has a fuel loan that is paid off in one year or less, it is considered a Current Liability.

LIABILITIES	
Current Liabilities	
Accounts Payable	\$4,000.00
VISA Credit Card	\$2,500.00
Payroll Liabilities	\$3,300.00
Fuel Bridge Loan	\$38,000.00
TOTAL LIABILITIES	\$47,800.00

Equity Section

The last section is the **equity section**, which includes an account called Retained Earnings. Retained Earnings contains all of the past earnings of the utility. Following this account will be the Net Income earned as of the date of the Balance Sheet. Whatever the date of the Balance Sheet, the accounting software will enter the Net Income or Loss from the same date into the Equity Section.

EQUITY	
Retained Earnings	\$24,700.00
Net Income	\$3,000.00
Total Equity	\$27,700.00
Total Liabilities and Equity	\$75,500.00

$$\text{Assets} = \text{Equity} + \text{Liabilities}$$

In other words: $\$75,500.00 = \$27,700.00 + \$47,800.00$

Everything of value in your utility = What the utility owns + What the utility owes

To understand Equity, think of a family that has a 4-wheeler and a snow machine. They borrowed \$2,000 from Wells Fargo to pay for the 4-wheeler:

Total Assets (Value of Property <i>Owned</i>)		Total Liabilities (Money <i>Owed</i>)	
Item	Value	Assets	Liabilities
4-Wheeler	\$5,000	Loan on 4-Wheeler	\$2,000
Snow Machine	\$4,500	No Loan on Snow Machine	\$0
Total Assets	\$9,500	Total Liabilities (what they owe)	\$2,000

This family's net worth [Equity] is equal to its total assets (\$9,500) MINUS its total liabilities (or the total of what they owe, which is \$2,000):

$$\text{Family Net Worth [Equity]} = \$9,500 - \$2,000 = \$7,500$$

In the same way as in the above example, it is possible to scan the summary information presented on assets, liabilities and equity and determine fairly quickly whether the utility is financially healthy. Below are two examples of balance sheet numbers, which tell entirely different stories:

Utility A		
Assets	Liabilities	Equity
\$800,000	\$700,000	\$100,000
This utility has \$800,000 in plant and equipment, yet they owe \$700,000. Therefore, the part of these assets that they own is only worth \$100,000.		

Utility B		
Assets	Liabilities	Equity
\$800,000	\$100,000	\$700,000
Utility B has a much better financial picture. Their assets are valued the same as Utility A, but they only have \$100,000 in loans. Their ownership of \$700,000 is much larger.		

➤ Things to Look at on Your Balance Sheet

- There should be **no negative numbers** on the balance sheet. If you have a negative number, you may have an error somewhere in your file.
- Are the bank **account balances on your balance sheet** close to the balances on your bank statement?
 - If they are wildly different, a possible reason for this is that there are **uncleared checks and deposits** causing the balance to be inaccurate. Once those transactions are processed through the bank, both numbers will be the same (in other words, your account is already properly reconciled, and you don't need to do anything further at this time).
 - On the other hand, with frequent employee turnover and absences, it is common for **inaccurate checks and deposits** to be entered into QuickBooks. These bad checks and deposits are seldom dealt with, which causes inaccurate account balances in your files. In this case, you and your clerk need to examine all the checks and deposits created that have not cleared and find out why. They may have to be deleted until the account balance (in your file) and the statement balance (from your bank) are close or equal.

- Sometimes the total balance in Accounts Receivable is inaccurate. It is common for this account to be inaccurate if the clerk has had no training in QuickBooks or if there has been high turnover. Oftentimes, because the clerk knows most of the customers, s/he has a **good idea of what the accounts receivable balance should be**. This balance in the accounting software can be cleaned up by looking at each customer and reconciling their balance with the customer ledger and the software.
- **Ask your clerk** if the unpaid payroll tax account (payroll liabilities) is accurate. If your clerk has been paying payroll taxes each payday and this liability account is high, there is a problem in this account also. If clerks are processing payroll tax payments incorrectly, this balance can be inaccurate even if they are current with tax payments.
- Are your **current assets larger than your current liabilities**? This would be good because it would mean your utility could pay their current liabilities with their current assets such as cash.

Following is a balance sheet similar to your QuickBooks balance sheet.

Example PCE-Eligible Utility Balance Sheet

Salmon River Utility Balance Sheet As of June 30, 20XX				
Assets				
	Current Assets			
		First National Bank Checking Account	\$30,000.00	
		First National Bank Savings Account	\$15,000.00	
		Safe	\$5,200.00	
		Employee Advances	\$300.00	
		Electric Accounts Receivable	\$10,000.00	
		Fuel in Tanks	\$10,000.00	
		Total Current Assets		\$70,500.00
Liabilities				
	Current Liabilities			
		Accounts Payable	\$ 4,000.00	
		VISA Credit Card	\$ 2,500.00	
		Payroll Liabilities	\$ 3,300.00	
		Fuel Bridge Loan	\$38,000.00	
		Total Current Liabilities		\$47,800.00
Equity				
		Retained Earnings	\$19,700.00	
		Net Income	\$3,000.00	
		Total Equity		\$22,700.00
		Total Liabilities & Equity		\$70,500.00

Fixed Assets

Your utility might not have any fixed assets listed on the QuickBooks balance sheet. They may be listed in a spreadsheet instead. Anything purchased with grant money is not classed as an asset and will not be on your balance sheet.

Other Assets

This is another type of asset that will probably not appear on your balance sheet. Your power plant was probably built with grant money, so it will not be listed in your accounting company file. Furthermore, assets purchased with grant money cannot be depreciated. Also, they are usually not carried on the utility balance sheet, but it's a good idea to track them on a spreadsheet.

➤ Inventory of Assets

All utilities should have an inventory of all their assets. Aside from merely knowing what the utility has and does not have, it is important for determining the amount of insurance needed to cover a potential loss. Any time a new asset is purchased by the utility, the asset spreadsheet should be updated.

Examples of assets that should be tracked on the spreadsheet are storage tanks, generators, distribution system, meters, load regulators – in other words, all of your expensive items in the power plant. You can make separate sections in your spreadsheet for assets purchased with grant money and assets purchased with utility money. It's important to know about all of the property belonging to the electric utility.

Each asset should be given its own identifying number. The number should be on the asset itself and should match the spreadsheet. It is very important to also keep a file which includes any warranty certificates, user's manuals and titles. This file should be kept in your safe. You should also make a scan of these certificates and titles and save them to your files in the cloud in case there is a fire or theft that causes you to lose the originals. You can create this spreadsheet in a computer program.

Chapter 6: Depreciation

Section Contents:

How to Calculate Depreciation

Expected Life Table (RCA)

Utility Asset Depreciation

Depreciation Tables of a Typical Rural Utility

Most assets lose value over time. Items are not worth as much money one year after we buy them, and they are worth even less than that, five years after we buy them. In the language of accounting, this is called **depreciation**. Depreciation is a way to quantify how much the value of an asset decreases over time due to usual wear and tear. In other words, using the method of depreciation, you can put a dollar amount on how much the value of an asset is decreasing each year. **Depreciation is an expense that can be recovered through customers' rates.** Remember, an asset is an item of lasting value in your utility such as engines, vehicles, and generators.

This method is very useful in planning, because it helps you predict when you will have to purchase a new asset or perhaps when it will need to be overhauled.



How do you decide what items are assets and will get depreciated and what items are recorded as expenses?

*Most utilities **set their own dollar value limit** to help with this decision. For example, if they decide to define "assets" as having a dollar amount of \$1,000.00, then a \$500.00 printer is not an asset. Instead, the printer would be considered an office supply expense. Some utilities might use a dollar amount of \$500.00. **Only assets are depreciated.***

➤ How to Calculate Depreciation

Your utility will use a method called **straight-line depreciation**. The formula for this method is:

$$\text{Purchase Price of Asset} / \text{Expected Life} = \text{Yearly Depreciation Expense}$$

Expected Life Table (RCA)

Following is a table from the Regulatory Commission of Alaska, which gives you the 'Expected Life' of your utility assets.

Asset	Expected Life (years)
Generators	14
Transformers	20-25
Poles, Towers	25
Overhead Lines	25
Underground Conduit	25
Meters	20-25
Services	25
Buildings	30
Office Equipment	10
Vehicles	4-6
Fuel Tanks	15
Computers	6
Streetlights	20
Power State Meters/Displays	10
Small Engines	5

For example: In 2019, Mr. Smith purchased a Polaris snowmachine for **\$10,000.00**.

This was a large purchase for him and when this snow machine no longer runs, he wants to be prepared to purchase a new one. Mr. Smith looks at the RCA Expected Life table and finds that the life for vehicles is five years. That means that, in five years, he needs to be prepared to purchase a new snowmachine, although it might last longer than its **book life**.

This Polaris snow machine is an asset.

The value of this asset goes down each year as Mr. Smith uses it.

Purchase price divided by the expected life of the snow machine = amount of value the snow machine loses each year:

$$\text{\$10,000 purchase price} / \text{5 years expected life} = \text{\$2,000}$$

The snow machine will decrease in value \$2,000 each year.

In the language of accounting, that loss in value is captured as a yearly depreciation expense. Below is a depreciation table for this snow machine:

Purchase Price: \$10,000	Depreciation	Book Value
Year 1	\$2,000	\$8,000
Year 2	\$2,000	\$6,000
Year 3	\$2,000	\$4,000
Year 4	\$2,000	\$2,000
Year 5	\$2,000	\$0

➤ Utility Asset Depreciation

Each year, a utility's assets are depreciated. **The depreciation expense number is needed for page six of the annual PCE report.** Depreciation is an estimate of how much book value your large plant items lose each year.

There are two accounts used to record depreciation: Depreciation Expense and Accumulated Depreciation.

Depreciation Expense	Depreciation Expense is an account on the Income Statement and it reduces net income.
Accumulated Depreciation	Accumulated Depreciation is a contra-asset account (this means it reduces the asset account). Accumulated Depreciation is subtracted from the asset account and reduces the asset section of the balance sheet.

Therefore, as your assets age, the assets on your balance sheet lose value, which reduces the utility's equity. On the Income Sheet, Expenses are increased with the depreciation expense. **Remember, depreciation should be recovered in rates and is eligible for PCE reimbursement.**

If, throughout the year, you have separated your high dollar tools and booked them in your Large Tool account, and if you have separated your large expenses for generators and other utility equipment, you will not have to go hunting for these amounts. Filing all of the vendor invoices for these purchases will also make preparing the yearly PCE report easy.



Tip: *If your utility has used grant monies to acquire a large dollar item, the item cannot be depreciated.*

Example Depreciation Tables

The following spreadsheets provide examples of depreciation tables for a typical rural utility.

➤ Depreciation Tables of a Typical Rural Utility

Column 1 Asset	Column 2 Fiscal Year In-Service	Column 3 Cost	Column 4 Expected Life (Yr)	Column 5 Accum Dep 1/1/16	Column 6 Book Value 1/1/16	Column 7 FY 2016 Depreciation	Column 8 Accum Dep 12/31/16	Column 9 Book Value 12/31/16
Street Lamps 2	1998	\$ 666.00	20	\$ 583.00	\$ 83.00	\$ 33.30	\$ 616.30	\$ 49.70
Prepay Metering	2007	\$ 25,970.00	10	\$ 22,075.00	\$ 3,895.00	\$ 2,597.00	\$ 24,672.00	\$ 1,298.00
New School Powerline	2009	\$ 62,152.00	20	\$ 21,756.00	\$ 40,396.00	\$ 3,107.60	\$ 24,863.60	\$ 37,288.40
FAA red LED Light	2010	\$ 4,200.00	10	\$ 2,310.00	\$ 1,890.00	\$ 420.00	\$ 2,730.00	\$ 1,470.00
GE Mechanical	2015	\$ 8,080.00	5	\$ 1,616.00	\$ 6,464.00	\$ 1,616.00	\$ 3,232.00	\$ 4,848.00
GE Mechanical *	2015	\$ 20,036.00	5	\$ 2,004.00	\$ 18,032.00	\$ 4,007.20	\$ 6,011.20	\$ 14,024.80
HP Printer Replacement	2015	\$ 1,558.00	5	\$ 156.00	\$ 1,402.00	\$ 311.60	\$ 467.60	\$ 1,090.40
Honda Foreman	2015	\$ 5,025.00	5	\$ 503.00	\$ 4,522.00	\$ 1,005.00	\$ 1,508.00	\$ 3,517.00
Smart Meters	2016	\$ 5,709.00	10	\$ -	\$ 5,709.00	\$ 570.90	\$ 570.90	\$ 5,138.10
GE Mechanical - Turbo Charger	2016	\$ 5,079.00	5	\$ -	\$ 5,079.00	\$ 1,015.80	\$ 1,015.80	\$ 4,063.20
GE Mechanical	2016	\$ 27,459.00	5	\$ -	\$ 27,459.00	\$ 5,491.80	\$ 5,491.80	\$ 21,967.20
TOTAL		\$ 165,934.00		\$ 51,003.00	\$ 114,931.00	\$ 20,176.20	\$ 71,179.20	\$ 94,754.80
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9

Column 1	Asset	Enter the name of the asset.
Column 2	Fiscal Year in Service	Enter the year the asset was purchased.
Column 3	Cost	Enter the purchase price of the asset. Notice that the total of Column 3 is the total original purchased value of all of the assets.
Column 4	Expected Life (Yr)	Using the RCA Table of Expected Life earlier in this chapter, select and enter the expected life of the asset.
Column 5	Accumulated Dep 1/1/16	This column is Accumulated Depreciation (in other words, all of the depreciation expense of the asset since the date of purchase). Each year, the yearly depreciation expense for each asset (Column 7) is added to the Accumulated Depreciation column. This column is the book value of the asset and is calculated by the spreadsheet. Book Value = (Column 3 Purchase Price of the Asset) minus (Column 5 Accumulated Depreciated)
Column 6	Book Value 1/1/16	For example: Two street lamps were purchased in 1998 for \$666.00. The RCA table says their expected life is 20 years. $\text{Book Value} = \$666.00 \text{ minus } \$583.00 = \$83.00$ $\$660/20 = \33.30 $\$583/\$33.30 = 17.5$ These street lights have almost been fully depreciated. In 2.5 years, they will be fully depreciated.
Column 7	FY 2016 Depreciation	This is the current year's depreciation expense. Using the street lights example, this is also calculated by the spreadsheet. Purchase Price = (Column 3 divided by Column 4)
Column 8	Accumulated Dep 12/31/16	This is the updated value of Accumulated Depreciation after adding the current year's depreciation expense.
Column 9	Book Value 12/31/16	New book value = Column 3 minus Column 8



Example of Page 6 of Annual PCE Report

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9
Asset	Fiscal Year In-Service	Cost	Exp. Life	Accum Dep 1/1/16	Book Value 1/1/16	FY 2016 Depreciation	Accum Dep 12/31/16	Book Value 12/31/16
Street Lamps 2	1998	\$ 666.00	20	\$ 583.00	\$ 83.00	\$ 33.30	\$ 616.30	\$ 49.70
Prepay Metering	2007	\$ 25,970.00	10	\$ 22,075.00	\$ 3,895.00	\$ 2,597.00	\$ 24,672.00	\$ 1,298.00
New School Powerline	2009	\$ 62,152.00	20	\$ 21,756.00	\$ 40,396.00	\$ 3,107.60	\$ 24,863.60	\$ 37,288.40
FAA red LED Light	2010	\$ 4,200.00	10	\$ 2,310.00	\$ 1,890.00	\$ 420.00	\$ 2,730.00	\$ 1,470.00
GE Mechanical	2015	\$ 8,080.00	5	\$ 1,616.00	\$ 6,464.00	\$ 1,616.00	\$ 3,232.00	\$ 4,848.00
GE Mechanical *	2015	\$ 20,036.00	5	\$ 2,004.00	\$ 18,032.00	\$ 4,007.20	\$ 6,011.20	\$ 14,024.80
HP Printer Replacement	2015	\$ 1,558.00	5	\$ 156.00	\$ 1,402.00	\$ 311.60	\$ 467.60	\$ 1,090.40
Honda Foreman	2015	\$ 5,025.00	5	\$ 503.00	\$ 4,522.00	\$ 1,005.00	\$ 1,508.00	\$ 3,517.00
Smart Meters	2016	\$ 5,709.00	10	\$ -	\$ 5,709.00	\$ 570.90	\$ 570.90	\$ 5,138.10
GE Mechanical - Turbo Charger	2016	\$ 5,079.00	5	\$ -	\$ 5,079.00	\$ 1,015.80	\$ 1,015.80	\$ 4,063.20
GE Mechanical	2016	\$ 27,459.00	5	\$ -	\$ 27,459.00	\$ 5,491.80	\$ 5,491.80	\$ 21,967.20
Snow Machine	2016	\$ 10,000.00	5	\$ -	\$ 10,000.00	\$ 2,000.00	\$ 2,000.00	\$ 8,000.00
TOTAL		\$ 175,934.00		\$ 51,003.00	\$ 124,931.00	\$ 22,176.20	\$ 73,179.20	\$ 102,754.80
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9

Using the snow machine example from earlier in this chapter, a line has been inserted at the bottom of the following spreadsheet. Looking at the Column 9, you can see that value of the snowmachine after depreciating it for one year is \$8,000.00. This is an example of a spreadsheet from Page 6 of the Annual PCE Report that gets submitted to the RCA.

Spreadsheet Updated for Following Year

To update the spreadsheet for the following year, copy the values in Column 8 into Column 5 and copy the values in Column 9 into Column 6. Change the dates. Columns 7, 8 and 9 should be empty, ready to receive next year's data. Update the year on the spreadsheet.

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9
Asset	Fiscal Year In-Service	Cost	Exp. Life	Accum Dep 1/1/17	Book Value 1/1/17	FY 2017 Depreciation	Accum Dep 12/31/17	Book Value 12/31/17
Street Lamps 2	1998	\$ 666.00	20	\$ 616.30	\$ 49.70	\$ 33.30	\$ 649.60	\$ 16.40
Prepay Metering	2007	\$ 25,970.00	10	\$ 24,672.00	\$ 1,298.00	\$ 2,597.00	\$ 27,269.00	\$ (1,299.00)
New School Powerline	2009	\$ 62,152.00	20	\$ 24,863.30	\$ 37,288.70	\$ 3,107.60	\$ 27,970.90	\$ 34,181.10
FAA red LED Light	2010	\$ 4,200.00	10	\$ 2,730.00	\$ 1,470.00	\$ 420.00	\$ 3,150.00	\$ 1,050.00
GE Mechanical	2015	\$ 8,080.00	5	\$ 3,232.00	\$ 4,848.00	\$ 1,616.00	\$ 4,848.00	\$ 3,232.00
GE Mechanical *	2015	\$ 20,036.00	5	\$ 6,011.20	\$ 14,024.80	\$ 4,007.20	\$ 10,018.40	\$ 10,017.60
HP Printer Replacement	2015	\$ 1,558.00	5	\$ 467.60	\$ 1,090.40	\$ 311.60	\$ 779.20	\$ 778.80
Honda Foreman	2015	\$ 5,025.00	5	\$ 1,508.00	\$ 3,517.00	\$ 1,005.00	\$ 2,513.00	\$ 2,512.00
Smart Meters	2016	\$ 5,709.00	10	\$ 570.90	\$ 5,138.10	\$ 570.90	\$ 1,141.80	\$ 4,567.20
GE Mechanical - Turbo Charger	2016	\$ 5,079.00	5	\$ 1,015.80	\$ 4,063.20	\$ 1,015.80	\$ 2,031.60	\$ 3,047.40
GE Mechanical	2016	\$ 27,459.00	5	\$ 5,491.80	\$ 21,967.20	\$ 5,491.80	\$ 10,983.60	\$ 16,475.40
Snow Machine	2016	\$ 10,000.00	5	\$ 2,000.00	\$ 8,000.00	\$ 2,000.00	\$ 4,000.00	\$ 6,000.00
TOTAL		\$ 175,934.00		\$ 71,178.90	\$ 102,755.10	\$ 22,176.20	\$ 91,355.10	\$ 74,578.90
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9

Chapter 7: Reading Meters

Section Contents:

Creating a Meter Reading Map

Meter Reading Sheet

New Customers

About Meters

Reading the Meters

Tips for Accurate Meter Reading

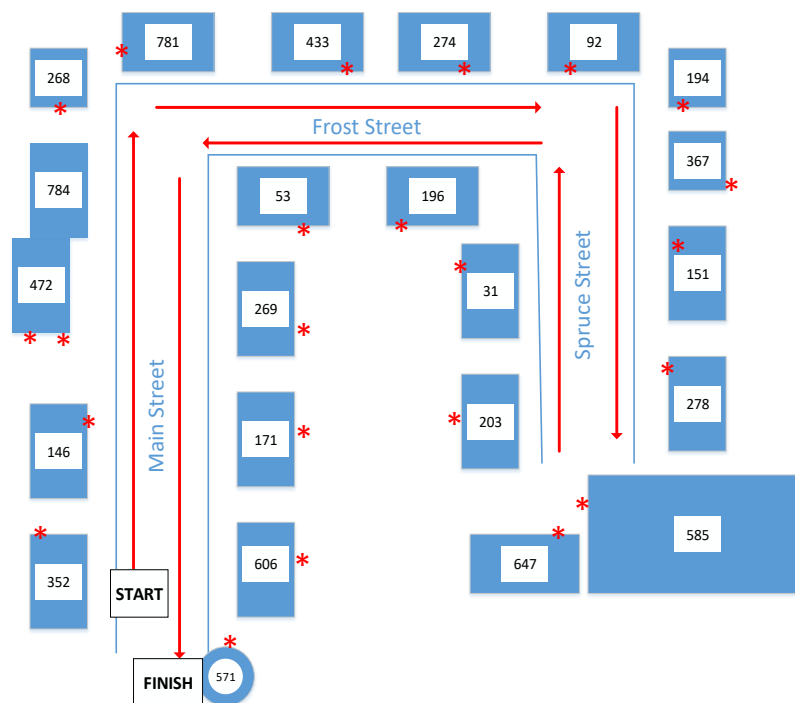
One Final Tip: Meter Turnovers

Electric utilities are required by the Regulatory Commission of Alaska to read all of the electric meters including the pre-pay meters each month. In order to keep rates low for customers it is key that every kWh delivered to customers accounted for. Pick a date, preferably the last or the first day of the month. Stick with this date. Reading the meters on the same day each month is very important. Have several utility employees trained to read the electric meters. If someone is sick or fishing or just needs time off, the utility will always have someone else to read the meters on the same day each month.

➤ Creating a Meter Reading Map

Drawing a map so that the meter readers can locate each meter is very helpful in making sure no meter is missed. Use a map of the town that shows where customers and meters are located. Create a route for the meter reader to follow that limits travel time. Include customer names and/or numbers or meter numbers on the map that directly correspond with the meter reading sheet.

Example Meter Reading Map



➤ Meter Reading Sheet

If the meter reading sheet is created in a spreadsheet program and the meter reader directly enters the readings into a tablet, there will be fewer errors. If readings are written on paper and then transferred to the spreadsheet, there is greater room for errors.

When the meter reading sheet is complete, it is given to the utility clerk so that the customer electric invoices can be created. Reference Chapter 8: Customer Invoices and Ledger for more information.

Example Meter Reading Sheet

Cust. #	Meter #	Customer Name	Customer Rate Class	Customer Location	METER READS		Previous Date	Previous Meter Reading	Current Date	Current Reading	Days in Reporting Period	kW Used
					Meter Multiplier	KWh Used Last Period						
352	987654321	Patao, Preston	R	14 Main St.	10	217	1/1/2018	92092				

The meter reading sheet should:

- Be in the same order that the meters will be read (consistent with the map).
- Include the customer number. This number should also be listed on the map.
- Include the meter number. If there is a meter change in the middle of the month, both meters can be recorded separately.
- Include the customer rate class. This will allow the meter reading sheet to be sorted to make it easier to fill in the customer ledger.
- Include the location of the customer. This can be an address or other location information.
- Include any additional information that will help the meter reader be accurate. Example: include the meter multiplier.
- Include the kWh used in the last billing period.
- Include the previous meter reading.
- Include the previous date the meters were last read.
- Include space for the current date.
- Include space for the current meter reading.

➤ New Customers

Following is a sample New Meter/Customer Form. New customers may however be taking over the house of another customer so there needs to be a meter reading for that

customer. If a customer are changing houses within your community, fill out the customer's old meter reading and complete the reading for the new meter at their new house. It is very important that you do not confuse these meter changes of new and past customers.

Example New Meter/Customer Form

Date:	Filled Out By:
Customer Name:	
Location:	
Old Meter #	New Meter #
Old Meter Ending Value:	New Meter Beginning Value:

➤ About Meters

The utility is responsible for the meter and the customer is responsible for the meter base. Meter bases must be installed by a certified electrician. If a utility is going to hire an electrician to travel to their community, they should make sure to have all of the needed materials on hand and to have several jobs lined up, so that the expense of the electrician is shared. Some utilities will add the charges of a new meter base to the customer's electric bill. Stainless steel meter bases are more expensive but in the long term they are worth it because they will last longer in coastal communities with salt spray in the air.

If any building is unoccupied and expected to stay that way, it is a good idea to remove the meter and install a meter blank to protect the insides of the meter base. Meter blanks are inexpensive plastic covers that can be purchased from electrical supply stores. A utility should always keep a few on hand. Be sure to use a meter ring and meter seal to keep the blank in place.

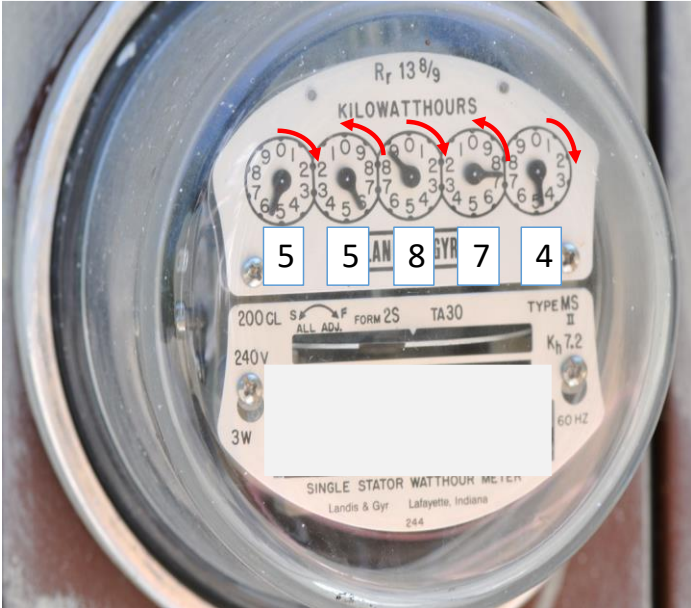
The meter always stays with the house. It does not follow the customer from house to house. Pre-pay meters stay with the house also. Remaining credit on a pre-pay meter can be removed using the Field Unit Software on the laptop that came with the AMPY system. Or it can be charged to the new customer and refunded to the former customer.

DANGER – NEVER REACH INSIDE A METER BASE—THIS IS HIGH VOLTAGE



➤ Reading Meters

Analog Dial Meter

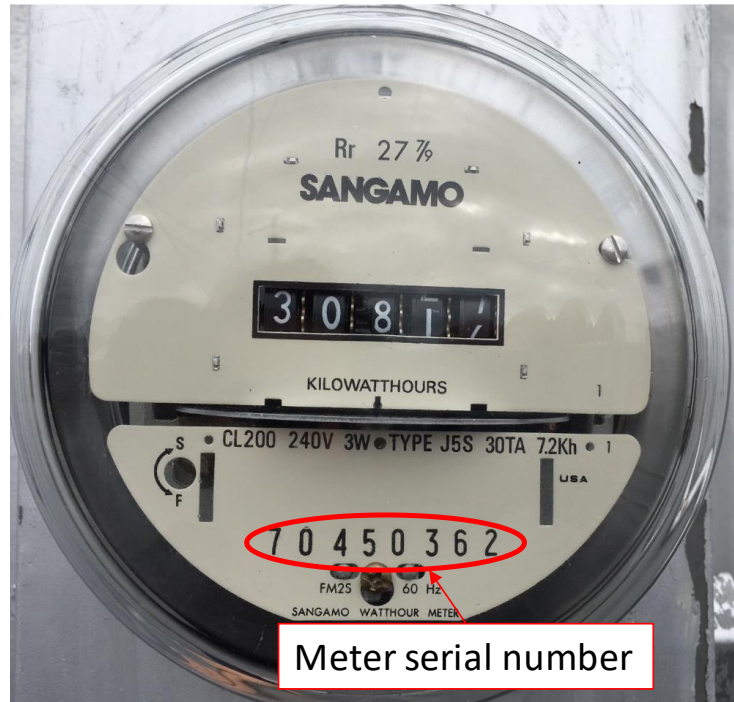
- Start reading the dials from left to right. Read the dials like a clock, although some numbers will be read clockwise, and some will be read counterclockwise. In the photo to the right, the red arrows were added to show which way each dial rotates; clockwise or counterclockwise. **Record the numbers starting from the right.**
- 
- If the hands of the dial are not on a number, round down to the previous number. For instance, the rightmost dial is almost to 5, but not quite. Record the number as 4.
 - The hand on the dial second from the right is between 7 and 8. Round down to 7.
 - The hand on the dial in the middle is between 8 and 9. Round down to 8.
 - If the hand on a dial looks like it is almost on a number, look at the dial to the right. If the number on the dial to the right has not reached zero, then the hand on the first dial has not yet reached the next number. For example, the hand on the second dial from the left in the meter above looks like it is almost a 6. Since the hand on the dial to the right is 8 and has not reached 0, you should record the number as 5 instead of 6.
 - The hand on the dial at the left is between 5 and 6. Round down to the number 5.

- If the dial is between 9 and 0, record the number as 9. If the dial is between 1 and 0, record the number as 0.
- The reading on this meter is: 55874.

Odometer-Style Meter

Read left to right, like a car's odometer

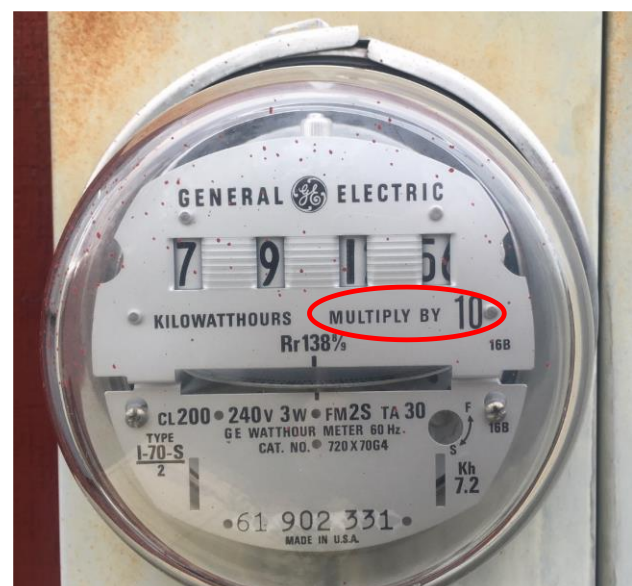
- If between numbers, use the lower value
- The meter to the left should be read as: 30816
- Meter serial numbers are generally eight digits



Odometer-Style with Multiplier

Read left to right, like a car's odometer

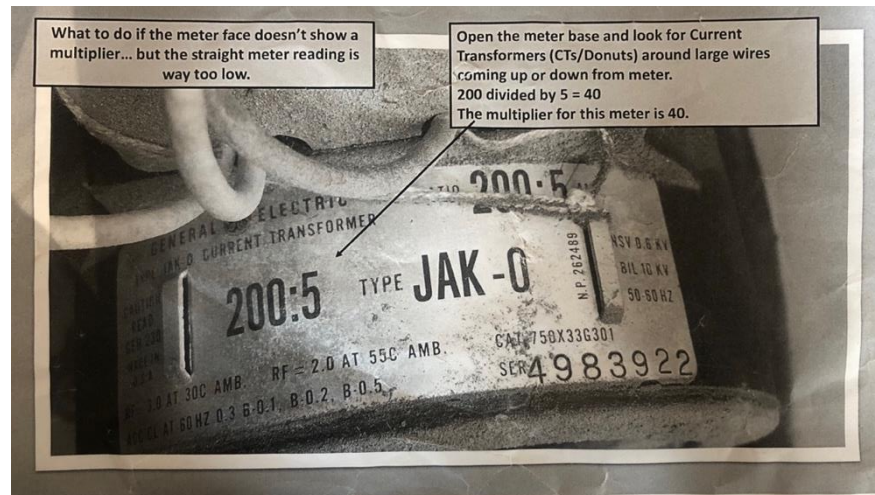
- If the dial is between numbers, use the lower value
- This meter includes a "Multiply by 10"
- This meter should be recorded as 7915.
- After recording the meter reading in the space for the current reading in your spreadsheet, the difference between the previous reading and



the current reading will be multiplied by 10.

Missing a multiplier will increase line loss and cause a utility to lose out on income.

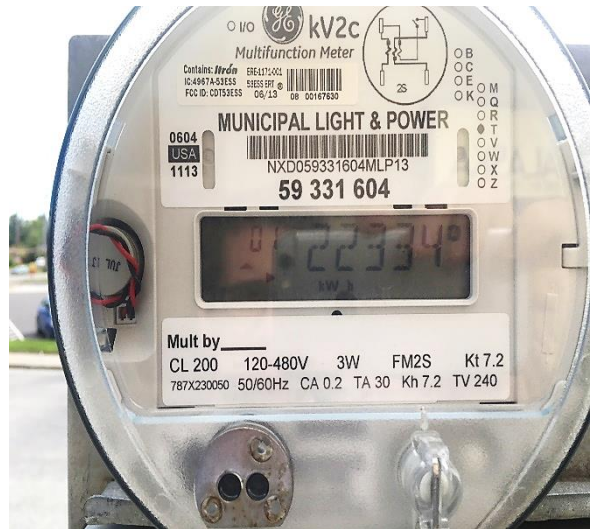
Current Transformer (CT/Donut)



The multiplier may or may not be written on the face of the meter. If it is not written on the face of the meter, look for **Current Transformers (CTs/Donuts, pictured above)** on the thick wire coming straight up from the meter. These 'donuts' will have a **ratio** such as **200:5**. Divide the larger number by the smaller number: $200 / 5 = 40$ (40 is the multiplier).

Digital

Read the meter left to right. Make sure that it is displaying kWh. Some digital meters display other data as well, such as maximum power. This meter displays the highest power in kilowatts (kW) that the meter had registered since it had last been reset.



➤ Tips for Accurate Meter Reading

- Encourage the meter reader to take a picture of the meter and bring it back to the office if there is doubt about how to read it.
- Meters may have more than one area with numbers. Always pick the area labeled kWh.
- Read every meter in town even if the person living in the house is away.
- If any customer has an abnormally high or low reading, have the meter reader check it again.
- Include the serial number of every meter for each customer to eliminate confusion.
- After reading the meter and entering the reading in the spreadsheet, CHECK YOUR WORK.
- Check for any meters with a reading of zero.
- Check to see if the meter appears to be tampered with.
- Does the reading seem reasonable for the type of customer? School? Residential?
- If you need to change a customer's meter between monthly readings write down the last reading of the old meter and the first reading of the replacement meter. On reading day, you will have an accurate reading. The customer will have two lines in the ledger and totals from two separate meters for their usage that month.

➤ One Final Tip: Meter Turnovers

If a customer's meter rolls over mid-month add 100000 to the new reading so you do not get a negative number when subtracting the previous month's reading. Remove the 100000 from the reading the next month when it becomes the previous reading.

If the previous reading was 99158 and it rolled over to a current reading of 1735, add 100000 to the current reading. This becomes 101735. Subtract 99158 and the total becomes 2577 total kWh. Next month, the current reading is 1735 (without the 10).

Calculating Meter Turnovers	
Previous Reading	99,158
Rolled over to	1,735
<i>Meter rolled over, so add 100,000</i>	101,735
<i>Subtract the previous reading $101,735 - 99,158 = 2,577$</i>	
Total kWh Used this Month	2,577
<i>$101,735 - 100,000 = 1,735$</i>	
Next month's "Previous Reading" will be	1,735

Chapter 8: Customer Invoices and Ledgers

Section Contents:

Creating and Understanding the Customer Ledger

Customer Rate Classes

Reviewing the Customer Ledger for Accuracy

Setting Up Your Accounts Receivable System

Customer Invoicing

Sample Customer Invoice

Collecting on Income

Monthly Data Summary Table

The Importance of Line Loss and Fuel Efficiency

Every month, the electric utility has fixed expenses that it must pay. These include all of the costs of generating power, payroll expenses and payroll taxes, and many overhead expenses to keep the utility going.

Sending out invoices asking for payment for the electricity is one of the most important jobs of the electric utility. All of the customer invoices and customer payments make up the utility's accounts receivable system. This is the one time each month a utility can ask for payments for their electrical services. Since invoicing your customers is so important, it is critical to have a good accounts receivable system. This chapter explains how to create and understand the customer ledger; the different customer classes that PCE-Eligible utilities create rates for; and strategies for improving your rate of collections.

➤ **Creating and Understanding the Customer Ledger**

As soon as the meters are read and the data is entered into the Meter Reading Ledger, the clerk should start preparing the customer ledger. The customer ledger needs to be sorted by Customer Rate Class so that all of the customers with the same rate class are

together. Customer invoices should go out on the same day at the beginning of each month.

Clerks may also use QuickBooks for invoicing electric customers and receiving payments. If you are using QuickBooks reports, it is not necessary to keep a spreadsheet customer ledger. This will save you a lot of time.

Pre-Pay Electric Meters are handled differently on the ledger. They have no past due amount or 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. For example, the resident may agree to pay 5% of their AMPY payment to arrears. If they are making a payment for \$100.00, \$5.00 will go to arrears and they will purchase \$95.00 of electricity. The space for previous balance and total due for pre-pay customers is shaded on the ledger to acknowledge no previous balance or balance due.



➤ Customer Rate Classes

Electric utilities may have different electric rates for different customer classes such as Residential, Commercial, Community Facilities and Federal/State. Alternatively, they may also have only rate for all of the customer classes. The electric utility clerk needs to be certain of the different rates and s/he also needs to know the PCE reimbursement rates.

Residential

The residential rate class is eligible for PCE reimbursement. To qualify for the residential rate, it must be a home or an apartment where people live and do not have a major business. (Alaska PCE rules state that no more than 25% of a residence may be used for commercial activities.) The electric utility will have a Residential Electric kWh rate and a

Residential PCE reimbursement rate. Residents receive PCE reimbursement for up to 500 kWh of their monthly electric kWh consumed if they are in good standing with the utility.

The state will not subsidize customers that don't pay their bills.

For example: Customer #167 Joe Smith used 600 kWh in April.

600 kWh x \$.90 (the residential electric rate) = **\$540.00**

500 kWh x \$.60 (the PCE invoice credit) = **\$300.00**

Current monthly electric charge owed by Joe Smith = \$540 - \$300.00 = **\$240.00**

During March, Joe Smith did not pay his electric bill. His past due balance is **\$178.00**.

Past due balance: **\$178.00**

Current Activity: **\$240.00**

Total Due = \$418.00

Joe Smith made a payment of **\$100.00** after receiving his invoice

Balance Due = \$318.00

Following is an example of Joe Smith's residential customer ledger:

Customer Rates per kWh													
Residential													
Commercial													
Community Facility													
Federal/State													
PCE Rate per kWh													
Residential													
Community Facility													
RESIDENTIAL	Cust. #	Class	Current Reading	Previous Reading	kWh Used Total	PCE	Energy Charge	Other Charge	PCE Credit	Current Activity	Old Balance	Payment	Amount Due
Smith, Joe	167	R	4800	4200	600	500	\$540.00	\$0	\$300.00	\$240.00	\$ 178.00	\$ 100.00	\$318.00

Community Facilities

Community Facility bills are calculated the same as Residential bills, but all of the kWh used are eligible for the PCE subsidy as long as the total does not exceed the community quota.

A community facility is a building or a space within a building that benefits everybody in the community. Examples of community facilities include the pump house, fire hall, tribal office, city office, clinic, VPSO office, sewer system, tank farm and community center. All community facilities must submit an application to the Alaska Energy Authority and be approved for PCE. Each community has a monthly maximum for their PCE subsidy. This is determined by multiplying their official community population by seventy. The official population is estimated every year by the Alaska Department of Commerce, Community, and Economic Development. The estimates are released each year on July 1. Communities only have **fifteen days** to dispute the estimate, so be sure to be alert and watch for this notice.

For example: If the community's population is 100

$100 \times 70 = 7000$ kWh each month will be eligible for PCE reimbursement.

If all the community facilities in the community use a total of 7500 kWh, they have exceeded the maximum.

If the maximum is exceeded, the utility decides how to distribute the PCE subsidy kWh among the community facilities.

Commercial Facilities

Commercial Facilities are not eligible for PCE. Examples of commercial facilities can be the store, church, processing plant, corporation office and school. Commercial Facilities are billed for the total number of kWh they use multiplied by their electric rate.

Federal/State

Federal and State facilities are not eligible for PCE. A federal/state facility is a building or space that is paid for by either the State of Alaska or the Federal Government. Examples of this: Automatic Weather Observation Station (AWOS), Federal Aviation Administration (FAA), Department of Transportation (DOT). Federal/State Facilities are billed for the total number of kWh they use multiplied by their electric rate.

Unbilled

Unbilled is a customer that the utility chooses not to bill such as a church, a clergy's home, elders and streetlights. When a utility decides not to bill a customer, they need to remember that they are legally required to be fair to all customers and their decision will affect all of their customers by having to increase rates to cover costs.

➤ Reviewing the Customer Ledger for Accuracy

Be sure to review your customer ledger for accuracy prior to creating the electric invoices. This is important because this data will also go to the monthly reports. Check the ledger for:

- Negative numbers
- Out of the ordinary numbers (too high or too low)
- Check the formulas and make sure they are calculating correctly
- Check the meter readings again
- Compare the ledger to the ledger from the previous month and look for anything out of the ordinary

➤ Setting Up Your Accounts Receivable System

What does a good accounts receivable system look like?

- The invoices or statements are easy-to-read and easy-to-understand.
- There are no typos or math errors on the invoice.
- The invoices go out the **same day each month**. If the utility is committed to consistent billing, they will send a message to the customers that this is a serious matter.
- The utility makes it easy for the customers to pay. They are open during the day and there is someone to receive the payment.
- The utility has a clear non-payment plan that is fair to everyone and everyone knows about it.
- The utility follows through when payment is not made.

➤ Customer Invoicing

Whether the electric utility uses QuickBooks to create and send invoices or they use some other software such as Word, the invoices all have to include the following:

- Customer name and address
- Utility contact information
- Name
- Address
- Telephone number
- Email
- The date the meter was read
- The number of days in the billing period
- The date the payment is due to the utility
- The previous balance
- Any payments received since the last invoice including the date of receipt
- The invoices should clearly state the service being provided and the cost of the service
- Amount owed in current billing period
- Amount owed for current consumption
- kWh consumed including previous and current reading
- Electric rate
- Total amount due
- Other customer charges
- PCE credit rate
- Number of eligible kWh for PCE credit
- Total dollar amount of PCE credit
- Current charges including previous unpaid balance, current energy charges, other customer charges and PCE credit

All invoices for customers received PCE reimbursement must also have the following two notices on them:

PCE Credit Notice

"For the current billing period, the utility will be paid under the State of Alaska's Power Cost Equalization Program (AS 42.45.100) to assist the utility and its customer in reducing the high cost of generation of electric energy."

Fuel Efficiency Notice

"For the reporting period that ended 1/31/2018 under State of Alaska's Power Cost Equalization Program, this utility's actual fuel efficiency for your community was xx.x kilowatt-hours per gallon. The acceptable fuel efficiency set out in regulations for the PCE program is xx.x kilowatt-hours per gallon." To calculate the actual fuel efficiency, divide the kWh generated by diesel fuel by the gallons of diesel consumed in the month. You will need to use the table below to determine the acceptable fuel efficiency for your utility.

	<100,000	100,000 to 499,999	500,000 to 999,999	1,000,000 to 9,999,999	>10,000,000
PCE minimum for >80% diesel	9.5	10.5	11.5	12.5	13.5
PCE minimum for <80% diesel	8.5	10	11	12	13

➤ Sample Customer Invoice

Following is an example of a customer invoice. This invoice can be created in your choice of word processing, spreadsheet or accounting software. This invoice must have all of the preceding information, plus the two preceding notices: PCE Credit Notice and Fuel Efficiency Notice.

Example Customer Invoice

Seal Hollow Electric Company 123 Main St Seal Hollow, Alaska 99555 907-444-4444 <u>clerk@sealhollow.com</u>							
						Date: 2/10/2018	
To:	Tennie Brinson				Date meters read: 2/1/2018		
	63 Spruce Street				Due Date: 2/24/2018		
	Seal Hollow, AK 99555				Amount Enclosed: _____		
Please return top portion of bill with payment.							
Date	Charge/ Credit amount	Previous Reading	Current Reading	Number of days in billing period	Rate	Usage/ Eligible	Total
	Previous balance						\$ 45.50
1/25/2018	Receipt of payment						\$ (35.50)
2/1/2018	Usage	75833	75133	31	\$0.75	700	\$ 525.00
2/1/2018	Other charges						\$ 5.00
2/1/2018	PCE Credit				\$0.40	500	<u>\$(200.00)</u>
	Current charges						\$ 340.00
NOTICES TO CUSTOMERS:							
<p>For the current billing period, the utility will be paid under the State of Alaska’s Power Cost Equalization Program (AS 42.45.100) to assist the utility and it’s customer in reducing the high cost of generation of electric energy.</p> <p>For the reporting period that ended 1/31/2018 under State of Alaska’s Power Cost Equalization Program, this utility’s actual fuel efficiency for your community was 12.4 kilowatt-hours per gallon. The acceptable fuel efficiency set out in regulations for the PCE program is 10.0 kilowatt-hours per gallon.</p>							

➤ Collecting on Income

Just because a utility has invoiced customers for sales and booked income, it does not mean that the utility has actually received the money from those sales. In order to pay for utility expenses, the utility must be able to effectively collect income. Uncollected income makes it difficult for a utility to pay for the expenses needed to operate and improve the utility. A utility should make it easy for a customer to pay their bill. Each customer should be given a handwritten cash receipt and if possible, the utility should be able to accept cash, check or credit card payments.

There should be a good system in place to record the payment accurately to the correct customer. If residents are paying their bills and their invoices are arriving with errors or incorrect balances, they will lose confidence in the utility. It won't be long before they get careless with their payments.

Strategies to Improve on Collections

What follows is a brief overview of some strategies for improving collections. For a more comprehensive look at other methods and strategies, please see the RUBA *Utility Collections Handbook* on how to increase collections.¹ Although that guide focuses on water and wastewater utilities, it is also applicable to rural electric utilities.

Step One: Establish a Consistent Policy

A utility must have clearly written policies that explain how customers are billed and the steps that are available for the utility to collect on bills. The procedures must be clearly written and understandable for staff and customers. The staff must be instructed to follow these written procedures and understand that this will lead to sustainability of the utility. Although it may be difficult in a small community, it is essential that all customers are treated equally, so that the rules apply to everyone fairly and everyone pays. Should a customer have a problem with the utility, the customer should create a written record and

1

<https://www.commerce.alaska.gov/web/Portals/4/pub/Utility%20Collections%20Handbook.pdf?ver=2016-10-07-112921-043>

address their problem in writing to management. If the customer is not satisfied with the outcome, they may appeal directly to the policy-making body. Any and all policies providing for the collection of bills must be reviewed and accepted by the utility's policymaking body.

Step Two: Establish Reasonable Rates

The primary key to ensure that income is collected is to be able to provide a service at a price that customers are willing to pay. Given the high costs of producing power in rural Alaska, it is important that each utility **work safely and efficiently** to deliver electricity at a fair price. This includes maintaining high levels of generation efficiency and low levels of line loss, so that each gallon of fuel goes as far as possible. Utility customers also need power to be available reliably and at the frequency and voltage required. Proper operations and maintenance will help ensure that customers receive the services that they are willing to pay for. In a number of communities, the poor quality and high cost of power has led major consumers (such as the school or fish processor) to choose to self-generate. Losing large customers results in increased costs to the remaining customers.

Step Three: Bill Regularly and Keep Good Records

The utility must keep accurate records of customers' bills and receipts. To enforce any collection policy, the utility must be able to prove that payments were not made and that the utility followed its written procedures.

Customers must be billed on a monthly basis, with payment due within 15 or 30 days. The bills should be clear about what is owed and the source of the charges. If the customer is eligible for PCE reimbursement, the bill must contain the information requirements for that program. Customer notifications should be available in electronic and/or physical bills, depending on what is suitable for the community. Notifications of payment dates and late payments can be sent by mail, email, and/or text. Make sure that the utility has appropriate contact information for all customers so that bills are not lost. Delinquencies should be mailed (or emailed or texted) on a regular schedule (30, 60, 90, 120 days) and the consequences of not paying the bill should be clear to the recipient.

If it is possible, **make it as easy as possible for customers to be able to pay the bill**, taking a number of different types of payment—cash, checks, credit cards, online payments—and providing the method to pay the bill in the notification (for instance, an envelope for

a check or cash). Providing a means for customers to prepay their bill, especially through a prepaid meter, has been shown to be effective in many rural Alaska utilities.

Step Four: Have a Plan for When Customers Don't Pay

Policies for repayment plans should be clear for all customers. The utility should have a clear policy on how long it will wait before determining billed sales are unrecoverable. It is recommended that the utility look at unpaid accounts on a yearly basis. The governing body will decide if these accounts can be collected or if they should be written off as a Bad Debt of the utility.

In addition to setting up systems to make it easier for customers to be successful in paying bills, the utility has other means at their disposal. Discontinuing services is used as a last resort but should be enforced for all customers. Of course, utilities should consider the weather and the physical danger and not disconnect customers when conditions would be dangerous. Likely the last means on collecting on bills would be to turn the collection over to collection agencies or through small-claims court.



Tip: *As an additional incentive for paying bills on time, customers must pay their monthly electric bill before the due date to receive PCE reimbursement credit from the utility.*

AEA does not reimburse for PCE if residential or community facility customers do not pay their portion of their monthly bill.

Since PCE sometimes covers up to 70% of a customer's bill, there is a strong natural incentive for customers to pay on time. It is important that customers understand this benefit and how it can adversely affect them.

When customers are behind on their bills, the utility should **assist them** with setting up a repayment plan, which will make them eligible for PCE reimbursement again. An electric utility may assess a finance charge for late payment of invoices. The finance percentage charge must be approved by the governing board of the utility.

If a payment is not received by the due date on the invoice, the utility clerk should make a telephone call to the customer asking about the missing payment. The customer will usually be given more time (ten days) to make the payment without a penalty. If the payment is not received within that timeframe, there should be consequences.

Idle threats do no good. If your utility wants a high collection rate, it has to be willing to follow through with a non-payment plan with consequences. **If the utility is making no attempt to collect, word will get around very quickly and no one will pay.**

Keys to Providing Service at a Reasonable Cost

- Work safely and efficiently.
- Maintain high levels of generation efficiency and low levels of line loss (see Chapter 17: Routine Maintenance and Chapter 19: Operational Performance Indicators for tips on how to achieve this).
- Establish proper Operations and Maintenance procedures and service all equipment regularly (see Chapter 17: Routine Maintenance for a typical schedule for rural utilities).
- Do your best to keep large paying customers, such as the school or local fish processors.
- Bill on a monthly basis and keep accurate records of customers' bills and receipts.
- Make it as easy as possible for customers to pay you.
- Inform customers that their PCE credit is dependent upon them paying on time and help them establish a repayment plan if they have fallen behind so that they can get caught up.
- Establish clear policies and enforce them for all members of your community.

➤ Monthly Data Summary Table

Whether you use QuickBooks or some other software for invoicing, take the time each month to create a monthly data summary table. You can use your spreadsheet program for this. After invoicing and filling out the PCE Utility Monthly Report (see Chapter 23: Utility Monthly Report), gather all of your meter reading data sheets and create a monthly summary sheet. Set up the spreadsheet to summarize all of the month's data so that it is easy to transfer to a Year-To-Date spreadsheet. The Year-to-date spreadsheet will be used to complete Page 5 of the Annual PCE Report.

➤ The Importance of Line Loss and Fuel Efficiency

Line Loss and Fuel Efficiency is a very important topic for all utilities. Also reference Chapter 19: Operational Performance Indicators for further discussion of this.

The RCA has created standards to encourage utilities to be efficient and economical with their fuel. Fuel is one of the larger expenses of rural utilities and there are ways to make it more efficient.

Lower fuel efficiency can be caused by a mistake in reading the fuel meter, contaminants in the fuel (dirt and water) and selecting the wrong size generator for the load. There are automated controls that will immediately switch generators when the load changes. This can result in a large fuel savings over the course of a year. By checking line loss and fuel efficiency each month, the operator can catch differences which can later lead to problems. Catching problems right away can save the utility money.

INVESTIGATE LINE LOSS EVERY TIME.

It is often a math error, but sometimes it can indicate a real problem that should be immediately fixed.

Chapter 9: Vendor Invoices

Section Contents:

Credit Cards

Debit Cards

Filing Vendor Bills

Staying Ahead of the Game

Vendor invoices are kept track of in the account called **Accounts Payable**, which is a current liability. Until a vendor bill is paid, it is a debt owed by the utility.

QuickBooks has an accounts payable section that includes a place to enter vendor bills and a place to pay them. Once a vendor bill is entered, it must be paid from the vendor section as a bill payment. When a vendor bill is entered, the expense appears on the Income Statement whether the bill is paid or not. When the vendor bill is paid, the vendor's account goes down and the checking account goes down.

➤ Credit Cards

Expenses paid for with a credit card are also considered current liabilities of the utility. QuickBooks also has a special section for credit cards. Credit card purchases are entered as they occur. They appear on the Income Statement when they are entered as expenses. When the credit card is paid, the credit card balance is reduced and the checkbook balance goes down also.

It is very important that the utility keeps track of utility credit cards and that they have strict procedures for who gets to use the card, and how the purchases get approved. It is also important that the bookkeeper is aware of the purchases as they occur because the credit card is committing the utility money and it is usually the bookkeeper that knows how much money is in the bank accounts. All credit card receipts should be turned into the bookkeeper immediately.



Tip: *Vendor invoices and credit card purchases should be entered as soon as the bill arrives in the mail and as soon as the credit card is used.*

If the utility does not pay off the credit card completely each month, the credit card company will charge interest on the unpaid balance. The utility should make sure that there are no unpaid credit card balances carried over to the next month. If the utility can't afford to pay off the entire balance each month, they probably should not be using a credit card.

➤ Debit Cards

Debit cards are different from credit cards because when they are used, the money comes directly from the checking account. It is just like writing a check. The utility needs controls over the debit card. All too often when the bank statement arrives, there is a section of debit purchases that the bookkeeper knows nothing about. S/he has to spend a lot of time asking questions and researching what purchases were made and who made them. The purchase receipts are often lost and there is no documentation for the purchase. The utility should create a clear policy for handling all debit card purchases.

A Word about Amazon

Once an Amazon account is set up with a credit card, user names, and passwords, the bookkeeper needs to protect it. Anyone ordering items on Amazon is spending utility money and these purchases should be approved. Many utilities need two signatures on their checks, yet utility personnel are ordering items from Amazon with no approval. It is important that the utility create some controls for ordering items on Amazon. It the

Amazon account has gotten out of control at your utility, change the password immediately.

➤ Filing Vendor Bills

The utility should have a file drawer for the vendor files. The vendor files should be set up for one year only and they should be boxed up and labeled at the end of the year. Some vendors will have their own manila file folder because the utility purchases from them frequently. Other vendors may be purchased from once and never again. For vendors that the utility seldom purchases from, set up file folders for the letters A through Z and file their bills alphabetically. Vendor bills are only filed in the file drawer after they have been paid. If the bill was paid with a utility check, staple the check stub to the bill. Unpaid vendor bills should be kept alphabetically in a file folder on the bookkeeper's desk or somewhere else separate from the paid vendor bills. When they get paid, move them to the paid vendor file drawer.

Credit Card Statements

Each utility credit card should have its own individual file and the credit card statements should be filed separately by credit card. Do not mix them all into one file. Make sure that the credit card statements are reconciled every month as soon as the statement arrives or reconcile it online.

Amazon

If your utility makes frequent amazon purchases, create a file for Amazon and keep it with the vendor files.

➤ Staying Ahead of the Game

The bookkeeper and the manager should always be aware of the amount of vendor debt the utility has at any given time. Credit cards that remain unpaid have high interest rates for the remaining balances. And vendors also charge interest for unpaid vendor bills. All of this interest adds up. **If the vendor debt gets out of hand, make a plan to get control of it.** Tighten up your purchasing procedures. Consider getting rid of the credit cards.

Chapter 10: Utility Financial Indicators

Section Contents:

Available Cash

Actual Expenses versus Budgeted Expenses

Collection Rate

Analyze Trends

Customer Satisfaction

Reading and understanding the two financial statements (Income Statement and Balance Sheet) will go a long way in helping a manager run the utility. There are, however, other indicators that will identify upcoming financial problems and will aid in going forward. After reconciling bank accounts and creating the financial statements, evaluate the following indicators:

➤ Available Cash

Your available cash is also called your **Working Capital**. It is the money in your utility that is not tied up. It is available for you to use. Simply looking at the balance in your bank accounts will provide an incomplete picture. To make the cash balance number more meaningful, instead evaluate it in terms of whether or not this available cash can cover all of the short-term debt and how much cash is left over after you pay off the short-term debt. Remember, the short-term debt equals all of your unpaid vendor bills, unpaid payroll taxes and unpaid short-term loan payments. This short-term debt is cash already committed by your utility.

$$\begin{array}{l} \text{Current Assets} \\ \text{Current Assets} \\ \text{Cash Accounts} \\ \text{Accounts Receivable} \\ \text{Advances} \end{array} \quad - \quad \begin{array}{l} \text{Current Liabilities} \\ \text{Current Liabilities} \\ \text{Accounts Payable} \\ \text{Payroll Liabilities} \\ \text{Short-term Loans} \end{array} \quad = \quad \text{Working Capital}$$

Current Liabilities is the total amount of cash that is already committed to vendors, state and federal taxes and short-term debt. When this total is subtracted from all of the **Current Assets**, the balance equals uncommitted cash which is the utility's working capital. This represents the operating funds, or the money available for day-to-day use.

➤ **Actual Expenses vs. Budgeted Expenses**

Comparing actual expenses to budgeted expenses should be done every month. After reconciling the bank accounts and creating the Income Statement, compare every expense account with actual expenses to the budgeted expense accounts. Hopefully, the budgeted vs. the actual numbers will be within 5% of each other. Any difference outside the range of 5% should be examined and these differences can be explained. If there are any large differences, the utility needs to make a plan going forward to cover these increased expenses.

➤ **Collection Rate**

To determine the collection rate on Accounts Receivable, you must calculate the total amount of accounts receivable invoiced for the month and divide it by the total amount of accounts receivable collected for the month. If the utility uses QuickBooks, create an Income Statement for a specific period of time---let's say six months:

Income Statement

From January 1 through June 30

- Record total Electric Income for the accrual basis (see Chapter 3: Creating a Budget)
- Record total Electric Income for the cash basis (see Chapter 3: Creating a Budget)

For example:

\$16,000 divided by \$20,000 = .8 = 80%

This means that \$20,000 in accounts receivable is invoiced and \$16,000 is received.

80% of receivables are collected.

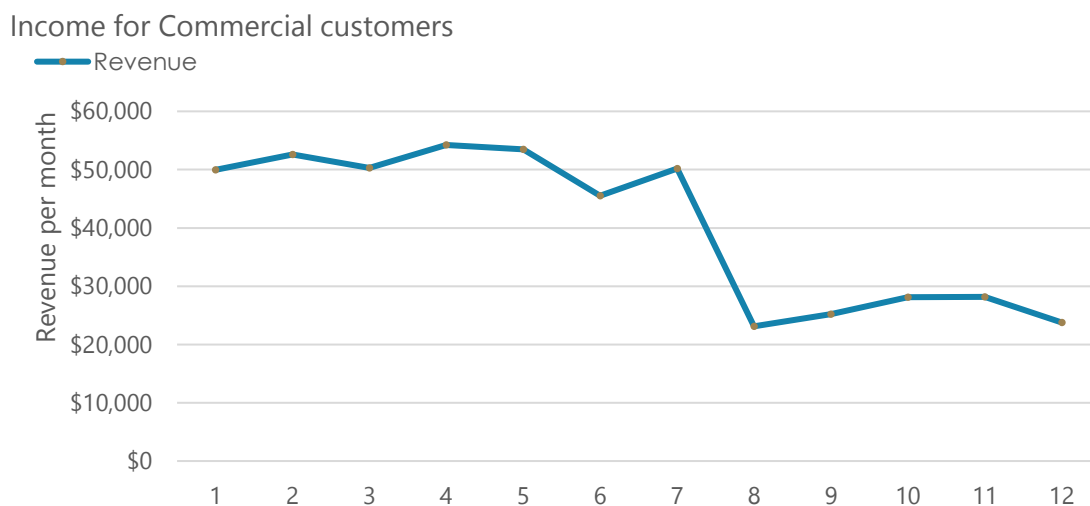
Therefore, there is an 80% collection rate.

➤ Analyze Trends

It is very helpful to look for trends in your utility. A trend is any general direction that something is heading. Maybe the population in your community is increasing---this is a trend. Maybe the winters are getting warmer---this is also a trend. It might be helpful for a utility to track their electric income to see if the **trend** is increasing or decreasing.

Tracking income is important because it can tell you if your utility is metering and billing customers properly. It is important that income flows into the utility on a regular basis so that the fixed expenses such as payroll, payroll taxes, fuel, electricity can be paid for each month. The chart below shows an example of how a manager could track Commercial Income to see if there are any problems or errors.

Example Trend Analysis



The vertical (y) axis (the line going up and down) lists different amounts of monthly income for commercial customers. The horizontal (x) axis (the line going left to right) has the months one through twelve which represent the twelve months of the year, January through December. If you look at the number five, you will know that in the fifth month of the year, May, the commercial customer income was approximately \$53,000. In the eighth month of the year, August, the commercial customer income was \$22,000.

Since the reason behind this decrease is not obvious from the chart, the manager will need to investigate. What changed?

- Did the utility lose a customer?
- Did a customer or many customers do energy efficiency upgrades?
- Did a meter on a commercial customer fail and the customer is no longer being billed?
- Did the utility install a new meter but the utility personnel are not reading it correctly?

Many different explanations could explain this decrease in income for the utility, but it is the manager's responsibility to make sure that the utility is accurately metering and billing all customers. On the other hand, if the decrease in income is the result of a permanent reduction in income from the commercial customers, the utility manager will need to make up the income somewhere else to cover the fixed costs. This may mean that the manager will need to change the rates that customers are charged and submit the necessary paperwork to the Regulatory Commission of Alaska.

➤ Customer Satisfaction

Another great indicator of the success of the utility is customer satisfaction. Create a small survey card and enclose it with your invoices. Ask your customers how the utility is doing. Ask them for any suggestions. Have them drop the card off at the utility and make sure you read them. Be sure to thank any resident that responded to your survey cards.

Chapter 11: Setting Rates

Section Contents:

Process to Help Develop the Cost-Based Rate

Calculating the Cost-Based Rate

Steps to Take After Changing the Rate

An electric utility gets the majority of its income from selling electricity to its customers. This income is needed to cover all of the actual expenses of the utility. Nonregulated utilities should calculate their customers' electric rates so that the rate income covers the utility's expenses. This is known as a cost-based rate. A utility can charge a single rate for all of the kWh sold to all of its customers or it can have several rates for different rate classes of customers. The rates charged by nonregulated utilities are not approved by the RCA. The utility can choose to charge any rate—either above or below the cost-based rate. It is assumed that co-ops, municipal utilities, and tribes will have a public process that will operate in the best interest of their customers. If the utility chooses a rate other than cost-based, it should set the rate with the knowledge that it is not cost-based, and they should have a compelling reason for making the decision. A utility should realize that if it chooses to charge a rate below the cost-based rate it will not have sufficient income to meet expenses and that the PCE-eligible reimbursement will be less than it could be.

No matter how a utility decides to determine its rates, the utility has a duty to its customers to ensure equity for all customers¹, that no customer classes are discriminated against, and that one or multiple customer classes do not unnecessarily subsidize another customer class. If the utility and the utility's policy-making body decides to provide subsidies across customer classes, those decisions should be made openly and explained to all customers, including the effect of the decision on their bills and level of service.

¹ 3 AAC 48.510(a)(3)

Rates should be reviewed each year during the budget development process (see Chapter 3). Fuel surcharges should be reviewed whenever new fuel is purchased (see Chapter XX), and at the same time, the utility should also review the expected generation (see Chapter XX) and line loss efficiency (see Chapter XX) so as to ensure that the expected fuel consumption is as accurate as possible for the expected kWh sales. Particularly if generation efficiency has decreased or line loss has increased, it is important to not underestimate the fuel cost per kWh of sales. Doing so will leave the utility with insufficient income to cover expenses and reduce the PCE reimbursement to eligible customers.

- Review fuel surcharges whenever new fuel is purchased
- Look at expected generation efficiency
- Look at line loss

➤ **Process to Develop the Cost-Based Rate**

The simplest example of setting cost-based rates is a single rate for all kilowatt-hours sold in the utility to all customers. In this case, the utility's operating expenses will be spread out over all the kWh sold evenly. Since the utility might have other sources of operating income, the cost-based rate only includes the income that needs to be raised by the customers' rates to cover the difference between the operating expenses and other sources of income including customer charges.

Customer charges are fixed charges. The charges appear on their electric invoice every month. It may be a monthly fee for the meter, a charge for invoicing, or a distribution fee for extra equipment.

Estimate kWh Sales

In developing a rate for the coming year, it is important that a reasonable forecast of the number of kWh that will be sold by the utility be made.

Before estimating future power sales, it is a good time for the utility to make sure that current sales are accurate. The utility should ensure that all customers are metered, that the meters are working, and that the meters are being read properly.

After the manager has determined an accurate reading for historical sales, the manager will need to estimate the sales for the next year. While many, particularly smaller utilities experience changes in sales from year to year, some methods can be used to more accurately forecast sales.

1. Determine any trends in sales by customer class. Over the past decade, most utilities have seen a drop in the amount of electricity consumed by residential customers, likely due to improvements in the energy efficiency of consumer products. Utilities can expect that efficiency of lights, computers, appliances, and other consumer products are likely to improve in the future.
2. Change in population/customers: Increases and decreases in a community's population will affect utility sales. It is expected that increased population should increase utility sales, just as decreased population will decrease sales.
3. The utility needs to plan for major changes in the community, either new loads such as a new or expanded industrial load or the closing of a community school.

If a utility needs additional help in forecasting sales, AEA has tools that can assist.

Total kilowatts expected to be sold in year: _____ kWh

Identify the Non-Fuel Costs

Using the Utility's Income Statement (see Chapter 4: Income Statement), fill in the total expenses for the non-fuel costs:

Total Personnel Expenses	_____
Total Operating and Maintenance Expenses <i>(Do not include fuel expense.)</i>	_____
Total General and Administrative Expenses	_____
Total Depreciation Expense	_____
Total Interest Expense	=====
TOTAL Non-Fuel Costs	_____

*For example:***Electricity rate needed to cover only Non-Fuel Costs**

Personnel Expenses:	\$156,610.00
Operating and Maintenance Expenses:	\$66,610.00
General & Administration Expenses:	\$13,000.00
Depreciation Expense:	\$13,610.00
Interest Expense:	\$10,780.00
Total Non-Fuel Costs:	\$260,610.00

Identify the Fuel Costs

A large percentage of the electric rate is used to cover the cost of fuel which is the biggest expense of most utilities. Using the same time period, calculate the total number of gallons of fuel used and multiply this number by the price per gallon of fuel.

Total Number of Gallons of Fuel Used _____

Purchase price per gallon of fuel _____

*For example:***Electricity rate needed to cover only Fuel Costs**

Total number of gallons used:	116,288
Price per gallon:	\$2.64
116,288 gallons * \$2.64/gallon	\$307,000.00

Combine the costs to cover non-fuel and fuel costs:

Total non-fuel expenses	\$260,610
Total fuel expenses	\$307,000
Total expenses	\$567,610

➤ Calculating the Cost-Based Rate

$$\text{Cost based rate} = \frac{\text{Utility Expenses} - \text{Customer charges} - \text{Other Income}}{\text{Total expected kWh sold}}$$

$$\text{Customer charges} = \text{monthly charge} * \# \text{ of customers} * \# \text{ of months}$$

For example: Given the following utility data

Other utility operating income	\$7,272.00
Total utility expenses	\$567,610.00
Number of customers	500
Customer charge per customer per month	\$5.00
Total expected kWh	1,151,500

The cost-based rate will then be:

$$\frac{(\$567,610.00 - (500 \text{ customers} * \$5/\text{customer}/\text{mo} * 12 \text{ months}) - \$7,272.00)}{1,151,500 \text{ kWh}} = \frac{\$506,338.00}{1,151,500 \text{ kWh}}$$

Cost-based rate = \$0.4606/kWh

This is the method that the RCA uses to determine the PCE rate, although the RCA may find certain expenses ineligible. In setting the customer rate, it is best to be conservative on the values (the expenses should be estimated high, the other income should be estimated low, and the expected sales should be estimated low) so as to avoid putting the utility in jeopardy of not being able to cover its expenses.

➤ Steps to Take After Changing the Rate

After the utility has updated the rates, the utility must go through the approval process with their governing board and then inform the customers about the new rates. The

manager should ensure that all customers are billed properly with the new rates. The utility must also inform the RCA about the new rates. If the utility does not report the rate change to the RCA, the utility's PCE level will be refundable. Once the RCA has recalculated the PCE level using the new rates, a new permanent PCE level will be established. If the new PCE level is less than the prior level, AEA will collect back the overpayment.

Regulatory Commission of Alaska

Fax (907) 276-0160 or email to: rca.mail@alaska.gov

Include:

- The name of the utility, switch from Rate x to Rate y
- Effective date
- Board Resolution
- Or the page from the Annual Report

Chapter 12: Planning for the Future

Section Contents:

Steps for Planning a Project

Creating the Utility's Improvement Project Plan Template

Example Improvement Project Plan Template

Where Will the Utility Get Money to Pay for the Project?

How Will the Utility Successfully Manage the Project?

Due to the important role that the electric utility plays in any community, the utility has a duty to its customers and to the community to be financially and operationally sustainable ten, twenty and fifty years into the future. In order to achieve long-term sustainability, the utility must have a plan. This plan must balance the customers' needs to have reasonably priced power with the utility's need for adequate income to pay for operational and capital costs. By developing a method to make investment, policy, and procedural decisions, and using data to help make decisions, the utility can better respond to the changing power needs of the community.

This chapter introduces a decision-making process that can be used by utilities to make short- and long-term decisions. Anyone interested in a more detailed planning process should look at the USDA Rural Utility Service Bulletin 1724D-101A "Electric System Long-Range Planning Guide."¹

Developing a plan for your utility is an ongoing activity. There should always be an ongoing list of projects. As events occur in the utility, new projects may be added to the list or with the passage of time or changes in the utility, some projects can be removed. The goal of all utility projects is to provide safe and reliable service to utility customers at a reasonable cost.

¹ https://www.rd.usda.gov/files/UEP_Bulletin_1724D-101A.pdf

If possible, the utility should focus on a single project at a time to make sure that each project is successful.

➤ Steps for Planning a Project

The utility board should create a process for developing project plans and getting them approved. This includes what type of information is required in the plan. If the utility is putting together the plan to apply for a grant, the format of the plan will follow the grant application.



All plans should consider the following:

1. **Why** is a project being considered?
2. Who is **responsible** for the creating the plan?
3. How will the utility **identify** needs?
4. How will the utility's needs be **prioritized**?
5. How will the utility identify **potential projects** to address priorities?
6. Where will the utility get the **money** to pay for the project?
7. How will the utility **finalize** the project plan and get authorization to move forward?
8. How will the utility **manage** the project successfully?
9. How will the completed project be successful in the **long-term**?

Why is a Project Being Considered?

Utilities may consider doing projects for lots of different reasons. Depending on why the utility is considering spending the time and money on a project, the planning process may be very different. Some questions to consider include:

- Is there an immediate problem that needs to be solved?
- Is there grant money available? Is it for a specific type of project, such as solar energy or streetlight upgrades? Or can the grant money be used for many purposes?
- Have there been complaints from customers that need to be fixed?
- Has an opportunity to reduce customer costs been identified or proposed?

Who is Responsible for Creating the Plan?

Someone should be responsible for creating the plan. This will probably be the utility manager, but it could be someone else appointed by the council or board. Whoever is responsible for putting together the plan should not be the same person that commits the utility's money to implement the plan. In most cases, other people will need to be involved in planning. Other utility employees should provide information about what can and should be done.

If the utility needs assistance, state, federal, and regional agencies and organizations may be able to help. Private consultants may also be available to assist with parts of the plan or doing all of the research.

How Will the Utility Identify Needs?

A common error that people make is to start a planning process with an end in mind. For example, they know they want to install a wind turbine, and they plan towards that end without looking at other options. Your utility should be focused on identifying any problems in delivering safe, reliable, and affordable power to customers.

This guidebook provides many ways to identify needs and not all are included in the checklist below. It is important that the utility's financial and operational records are looked at so that the utility does not miss the easier ways to improve the safety, reliability, and affordability of power. Some questions to explore include:

Questions to Consider while Planning for the Future:

Do you have enough skilled employees?

- Do any areas of your utility lack in skilled employees?
- Are you happy with your office staff?
- Are your employees committed to their jobs?
- Does your community have more skilled employees to select if you lose one?
- Do your employees have the proper training and certifications?

How are the finances of your utility?

- Does your income cover your expenses?
- Are you in debt paying off prior purchases and/or repairs, or payroll taxes?
- Do you have an office clerk capable of handling the utility finances?
- How is your collection rate? Are your customers paying their invoices each month?
- Do you have high line loss? Have you determined why it is high?

Is your utility safe for utility employees and customers?

How is your generation efficiency? Are your engines properly sized for the load? Can your switchgear select the most efficient engine to operate?

Does your utility provide reliable service to customers? Do all customers get the voltage and frequency they require?

Have you done an inventory of your physical power plant and all of the equipment inside of it?

- What is the current condition of your plant and your equipment? Identify any improvements that should be made.
- Do you foresee any major overhauls and/or replacements of power plant equipment? Does your technology need upgrading?

Are you going to need to plan to generate more or generate less electricity in the future?

- Has your utility been selling more or less electricity?
- Is the population of your community going up or down?

Are new projects being built that may require additional electricity? Are any customers going away?

Examining your employees, the power plant, equipment, collection rate, finances and the number of your paying customers should help you identify any problems, weaknesses or threats to your utility. Look at your work orders. Are there any that are outstanding? Are there any potential projects discussed in the work orders?

If a utility manager cannot define exactly what needs to be done, the improvement plan should include a study to determine the cause of issues and recommend the most cost-effective solution. External assistance from state and federal agencies, as well as private contractors is available.



How Will the Utility's Needs be Prioritized?

It is likely that you will find several projects to be tackled at once. Since you cannot do everything that needs to be done, you will need to figure out what is the highest priority. The utility should come up with a way to prioritize the needs. What follows is one possible way for the utility to prioritize needs.

Similar to prioritizing word orders, there are three factors that can be used to prioritize the utility's needs:

1. The type of issue;
2. The seriousness of the issue; and
3. How quickly the issue must be resolved.

All issues should fall into one or more of the following categories:

Financial stability of the utility	Before a utility can successfully tackle tough operational issues, the utility needs to be financially stable with enough income to cover the necessary expenses.
Safety	Safety includes all potential harm to workers and the public. If an issue could cause injuries to workers or the public, this should be the highest priority.
Risk of catastrophic failure	This includes issues that could lead to long-term outages and/or destruction of property. These can be either caused by the natural environment (such as floods, thawing permafrost, eroding banks) or people related (such as vandalism.)
Reliability	Reliability includes less catastrophic, but still serious issues that can cause service disruptions. These can include distribution system issues such as trees overhanging the electrical lines or generation issues due to inadequate maintenance.
Efficiency	Efficiency includes issues that increases customer costs from inefficient operations. These can include issues in the distribution system that increase line loss (oversized or inefficient transformers) or poor servicing of the engine that has decreased engine efficiency.
Lost Income	Lost income includes issues that decrease the ability of the utility to capture income. These can include an inoperable heat recovery system or broken meters.

After categorizing the type of impact, the **seriousness of the issue** should be estimated as high, medium, or low.

High is anything that could cause a major problem for the utility or community. These include major safety issues that could result in the potential loss of life or severe injury, significant fuel spills, severe damage to property, and/or major loss of income. Other high magnitude issues could be the powerhouse or other infrastructure near an eroding bank or threatened by active permafrost thawing.

Medium is less severe than High, but the consequences for letting it go on could increase or could become a danger to the power plant and/or the community.

Low includes issues that may have low consequences, but that the utility still would need to fix when time and money permit.

The manager should also estimate **how quickly the issue must be resolved**. Some issues may need to be fixed immediately (an engine has failed unexpectedly) whereas some may be years away (the river is moving slowly towards the powerhouse).

Whoever is responsible for putting the plan together should weigh the types, seriousness, and time sensitivity of the utility's needs to come up with the top things to try to improve.

➤ **Creating the Utility's Improvement Project Plan Template**

This chapter includes an **Improvement Project Plan Template** that can be used to write up each project. They should be numbered by priority.

The box at the top right of the template helps keep track of the improvement projects that have been accepted or rejected. A space is provided to write a short note about why a project was rejected. These notes can be useful if there is turnover at the utility, so that people do not repeat something that has already been done.

Include two to three sentences that explain:

1. what will be done,
2. why the project is needed, and
3. what benefits are expected.

As much as possible, the benefits should be specific and they should result in saving money.

Example Project Description

Do top-end rebuild of engine #1 because the oil consumption has increased and the generation efficiency has dropped below acceptable levels. It is expected that the rebuilt engine will increase the average generation efficiency from the current 12.5 kWh/gallon to 13.5 kWh/gallon. If generation and fuel costs stay the same, this will save the utility \$15,000 in fuel per year.

➤ Example Improvement Project Plan Template

The following is a template that may help your utility discuss, prioritize and plan your upcoming improvement projects. It includes seven sections to describe the details of the project and how progress will be measured, tracked, and reported.

Seven Elements of a Project Plan Template

Scope: This section should describe the project. If there are stages to the project, they should be described. It is a description of the work that must be done to deliver a project.

Personnel responsibilities: For each part of the scope, it should be clear which tasks are the responsibility of utility staff along with an estimate of the number of hours required for each task.

- Manager is responsible for Task X and Task Y. Task X will take 50 hours in Year 2 and 100 hours in Year 3. The manager has sufficient time to complete these tasks and no new funding is needed
- Utility operator is responsible for Task A and Task B. Task A will take an additional 200 hours in Year 1-4, and Task B will take an additional 100 hours in Year 3. The additional hours will need to be included in the budget.
- A new employee will need to be hired to do Task C at 800 hours per year for 3 years.

Additional resources needed: Include all resources that the utility does not currently have to complete the project scope. Resources may include operator or clerk training, contractors and consultants, parts and materials, and infrastructure. Are there any state, federal or native corporations that could provide assistance? A rough estimate of the cost should be included.

Schedule: A work schedule should be created that includes deliverables and milestones. A deliverable is a product that the utility receives through the process—it might be a study or a report or a completed wind farm. A milestone is a checkpoint that allows the project manager to keep track of what has been done and what still needs to be done. Each deliverable and milestone should have an expected date for completion. The schedule can be shown simply as a list of activities with expected start and finish dates.

Budget: Based on the personnel responsibilities, additional resources needed, and schedule, a rough budget should be created. Use the same expense categories as in your chart of accounts. Be sure to estimate your costs over the next few years so that you can be sure you are making a wise decision for the long run.

Metrics to track to measure success. It is important to begin thinking early on about how an improvement project's success will be measured. If the project saves the community money or improves service, it is important to be able to show the success. People want to know if the project worked out. On the other hand, if the project does not go as planned, it is important to know what did not work so that it can be improved. Metrics should be simple. For instance, if the expected benefit is an increase in generation efficiency to 14 kWh/gallon, then you should track generation efficiency.

Accountability: Making sure that someone holds the utility accountable for improvement projects and the overall improvement plan can be an important part of the success. The utility board is the most likely body to hold the utility accountable. The utility's customers should be informed so they can help hold the utility accountable.

Improvement Project Template

Improvement Project Template	
Improvement Project #	Approved? Yes / No
Date:	If not approved, why not?
Summary: What the project is, why it is needed, and the potential financial & non-financial benefits:	
<hr/>	
Project description	
Scope	
<hr/>	
Personnel responsibilities	
<hr/>	
Additional resources needed (include contracted people and equipment)	
<hr/>	
Schedule	
<hr/>	
Budget (by year and category)	
<hr/>	
Metrics to track to measure success (e.g., kWh/gallon)	
<hr/>	
Accountability (Plan for reporting project progress)	
<hr/>	

The utility manager should have a plan for when to provide updates and what the updates will include. The schedule for updating stakeholders, including the board and customers, should be realistic both for the utility and for others' schedules.

The accounting and the budget need to be carefully monitored. If the clerk has the necessary training for this s/he should provide monthly project reports. If the clerk does not have the qualifications necessary for reporting on a project, the utility should hire outside help. Monitoring the finances of the project is critical so that if it goes off track, the utility will know about it right away before it is too late to make adjustments.

➤ **Where Will the Utility Get Money to Pay for the Project?**

Unless a project can be covered by the utility's current budget, additional funding will have to come from somewhere—utility equity, grants, or loans. No matter where the funding comes from, for many PCE-eligible utilities, a public budget process is required. In cities, budgets are approved after public hearings and the budget plan is approved by the city council/assembly. Likewise, most tribes and non-profits have budget plans that must be approved by the governing body.

The utility's options for funding the project are:

Use utility equity: If a utility has been able to build up profit over the years and has sufficient savings or investments, the utility could use that cash to pay for the project without any other help. In some cases, a utility might have unused or underused assets that could be sold to pay for the project.

Apply for grants: A well thought out planning process will make a grant application stronger and more likely to be funded as it will help to show the importance of the project to the utility.

While grants are generally "free" money, there are potential pitfalls to watch out for when planning to use grants to pay for a project. Relying on grants can put a utility in a bind because of the uncertainty of receiving a grant and the timeline of the grant application, review, and the award may not fit the utility's needs. Grants may also have tax implications or recording requirements that may cause expenses that might be paid for through the grant.

It is also important to understand how a project may interact with the utility's existing infrastructure because upgrades to existing engines, generators, or switchgear may be needed. If the grant doesn't pay for these upgrades, the utility may be on the hook for a lot of money to integrate the project with the rest of the powerhouse. This is an issue quite a few PCE-eligible communities have run into.

With less grant money from the state and federal governments to go around, utilities will need to look for alternative funding sources.

Take out a loan: Sometimes the best option for a utility is to take out a loan to pay for a project. Although a utility will have to qualify for a loan, as lenders expect the loan to be repaid, loans will allow a utility to take care of projects without cash on hand. A utility would be able to plan the project for when the utility wants to do it, not when they might be able to secure a grant. This will likely lead to more benefits to customers in having safe, reliable, and affordable power.

Many PCE-eligible utilities have used loans to pay for utility improvements. While other federal and private lending options exist, AEA's Power Project Fund loans are an excellent option for the size and types of loans common for PCE-eligible utilities.

Since the loan's interest and the depreciation of the asset are both eligible expenses for the Power Cost Equalization program, PCE will likely cover most of the loan's expenses for PCE-eligible customers.

Combination of funding sources: The likely, best-case scenario in today's funding climate is that the utility will put a number of funding sources together—a grant, a loan, and maybe some utility equity—to pay for the project. It is rare that a grant does not require a match of some sort and grants may be targeted for particular phases or types of projects.

**Remember: If the project is important,
always have a backup financing plan.**



After the utility's needs have been identified and prioritized, a project or multiple projects have been identified, and funding has been found, the utility has to finalize a plan and provide the authorization to move forward. The board may need to pass a resolution and/or a new budget.

➤ How Will the Utility Successfully Manage the Project?

A project manager, which might be the same person who was responsible for putting together the plan, should be assigned who will be responsible for completing the project. Ideally, the person will have experience managing similar projects. The project should have a clear scope, schedule, and budget. The project manager should be required to report on the progress to the utility's board. Project management assistance is available from state, federal, and regional agencies and from private contractors. A good project manager can make or break a project. Make sure you have someone who has the time and experience to manage the project. There are many resources available to learn about project management—books, websites, and courses can easily be found to ensure project success.

One part of the planning process that sometimes gets forgotten is planning for operations. A particularly complex project may require a business financing and operations plan, so that the necessary income is collected for the inspections and maintenance to be done in a timely manner. Utility staff might need training, or new staff might need to be brought on board. The utility board should require that a long-term plan be included in the final project plan before funding for the project is authorized. Too many times projects have failed after things were completed because regular, preventive maintenance was not performed. Don't let this happen to your utility.

Part II: Operations

Chapter 13: Overview of a Power System

Section Contents:

Fuel

Air

Gensets

Switchgear and Controls

Step-up Transformer

Distribution

Customer Meters

Financial management is just one part of running a business. The utility still has to deliver services to customers. Running a utility is complex. A utility manager must:

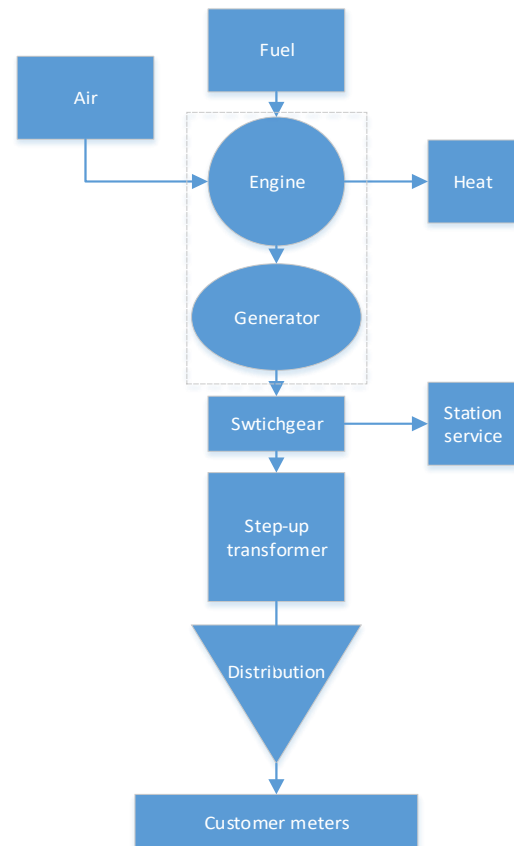
- Provide regular maintenance for multiple generating units
- Ensure that there is sufficient fuel
- Monitor and order supplies to keep the utility and all of its equipment running
- Distribute power to all of the utility's customers
- Provide the power safely, reliably and at a reasonable cost.

The next few chapters should provide sufficient information for a utility manager to *manage* the maintenance—not actually *perform* it. The information in this section will assist the utility in developing a preventive maintenance plan and a system for identifying and prioritizing non-routine maintenance.



Before we jump into the specific inspection and maintenance procedures recommended for rural Alaska utilities, this section will provide an overview of the basics of power generation, including an introduction to the names and functions of important components in the generation and distribution system.

The majority of rural Alaska communities receive most or all of their power from diesel-powered generators (these are also called engine-generator sets, or *gensets* for short). As shown in the figure to the right, a number of components work together to convert diesel into electricity consumed by customers. The *powerhouse* contains and protects most of the power generation components.



The Fuel System

Without fuel, a diesel-powered engine will not operate. The fuel system begins at the gas tank where the diesel is stored. It is a system made up of fuel lines, fuel filters, fuel injectors and fuel pumps, which feed the diesel into the engine where it is mixed with air and ignited.

In some powerhouses, used oil from the engines is collected, filtered, and blended with diesel fuel to be burned in the engines. The system will typically achieve a mixing ratio of approximately 0.5% used oil to diesel fuel. The **used oil blending system** provides a useful way to dispose of the engine oil that must be changed on a regular basis.

In most communities, in order to limit the amount of fuel spilled from a catastrophic failure, several tanks are used to store fuel on its route to the engine.

Intermediate tank is generally connected to the larger tanks in the bulk fuel tank farm. The intermediate tank will hold enough fuel to power the engines for weeks or months.

Day-tank is smaller and may or may not hold sufficient fuel for the day.

- Some day-tanks are fitted with a fuel meter, which will provide information about the engine's fuel consumption. This information is vital for managing the utility's fuel inventory, operations, and reporting.
- Utilities participating in the PCE program are required to have an operational fuel meter on the day tank.
- The day-tank provides diesel fuel to all of the engines through a piping manifold. In the engine, a fuel filter cleans out any impurities before the fuel pump pressurizes the fuel to deliver it to the fuel injectors. The pressurized fuel is injected into the engine's cylinders to be combusted.
- If the day tank fuel filter is clogged, eventually the fuel level will drop to the point that the all gen-sets will shut down due to lack of fuel, causing a system outage.
- If the engine fuel filter is clogged, the engine will be starved of fuel and will result in an engine shutdown.
- If the fuel injectors are clogged, too little or too much fuel can be delivered to the cylinder, which can make the engine run inefficiently or not at all.
- **Having a clean fuel system is vital to making sure your system is operating properly.** A fuel system that's dirty will affect power, performance, fuel economy, and will eventually cause engine failure. It can also have a direct impact on some of the other engine systems.

➤ Air

Since air, specifically oxygen, is needed for the diesel fuel to combust in the engine, **powerhouses must have sufficient airflow to supply the engines.** This intake air also helps to cool the building, protecting any electronics in the building from overheating. **Ducted air intakes should be included in all powerhouses.** This intake air should be filtered to prevent large particles from being sucked into the powerhouse. These primary **air filters** need to be changed on a regular basis or the engines may not run properly.

Before the air goes into the engine, additional air filters are used to clean the air further. If the engine air filters are not cleaned and replaced regularly, the engines can be starved

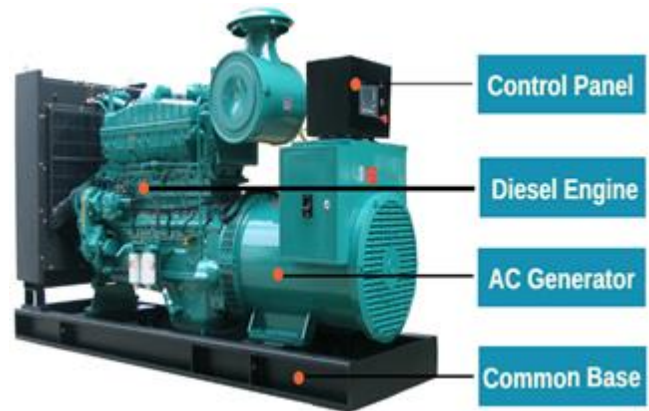
of oxygen. Insufficient air will cause the engines to run inefficiently and potentially cause permanent damage to the insides of the engine.

Change out the air filters in your gen-sets regularly.

➤ Gensets

It is not uncommon for people to confuse the terms “engine” and “generator.”

The basic structure of a [diesel generator set](#) (genset) is composed of a diesel engine and generator. The diesel engine is used as power to drive the generator to generate electricity.



A diesel generator set is generally composed of four parts: diesel engine, AC synchronous generator, control panel and common base.

Engine

The engine combusts (burns) diesel to produce mechanical energy. The engine is a much more complicated machine than the generator, and most maintenance will be done on the engine.

Diesel-powered engines are simpler than gasoline-powered engines and have fewer parts that can fail. A diesel engine does not have spark plugs, distributors, or timing equipment. If the engine is electronically controlled, monitors are available to access data such as temperatures and pressures through the [engine control unit](#) (ECU). If it is a mechanically controlled engine, physical dials will provide all the needed data.

The utility manager should be familiar with the normal ranges of engine temperature and pressure and understand the type and severity of potential problems if these numbers go outside of the normal range.

Generator

Every engine in the powerhouse is connected to a generator through the crankshaft. In order to produce electricity, the generator must have a battery to power the exciter. As the exciter spins within the generator, power is produced at the generator's design voltage.

Power is produced as either single-phase or three-phase. A utility's generators produce alternating current (AC) power. Different from the direct current (DC) supplied by something like a battery, AC means that the current changes direction in regular intervals. This is its **frequency**. American electrical systems are all based around AC power delivered at 60 Hertz (Hz), or 60 cycles per second.

Since the direction changes in AC power it has a wave-like quality, a generator is able to produce multiple phases of AC at the same time. Since multi-phase power is more efficient to produce and distribute, single-phase power is rare in Alaska's communities. Each of the phases of **three-phase power** will be delivered from the generator, through the switchgear and the distribution system to customers on a distinct conductor.

Cooling

Burning (combusting) diesel in an engine produces a significant amount of heat. While some of that heat is used, **60-80% of the energy in the diesel must be removed so that the engine is not damaged**. Some of this energy is removed through the exhaust, which is the most direct way that the engine is cooled. The exhaust gases are potentially dangerous and very hot, up to 900°F. These gases are directed outside of the powerhouse. Exhaust gases should be colorless. If they are not, this is an indication of an engine problem.

Not all of the engine heat is removed with the exhaust gases. A **cooling system**, generally using a glycol and water mixture, pumps fluid through the engine block that runs to remote radiators. This is sometimes called jacket water heat and can be used to provide space heat to other buildings through a **heat recovery system**. The heat recovery system includes a heat exchanger that transfers the jacket water heat into a secondary loop that pumps a hot glycol-water mixture to other buildings. **A heat sales agreement with other building owners can be a new form of income for the utility** and can be used to reduce customer rates. A powerhouse would need an energy meter to monitor the heat delivered to customers through the heat recovery system.

A series of filters, pumps, and seals for both the engine's cooling system and heat recovery system must be inspected and maintained to ensure that coolant can flow through the system. If the cooling system is plugged, the pumps fail, or there is insufficient fluid, the engine can be severely damaged or even destroyed. An emergency scenario such as this could cause significant disruption for a rural community and be very expensive for the utility.

Exhaust gases should be colorless.

Lubrication

In order to withstand the high temperatures and stresses caused by combusting diesel, an engine must be very strong. This is why they are made out of metal. The downside is that, with all of the parts that must move within the engine (such as the pistons moving up and down in the cylinders, or the crankshaft rotating), there would be a lot of metal-on-metal rubbing. To allow the engine to operate, **all of the moving metal parts must be constantly lubricated.**

Increased oil consumption, as well as reduced engine efficiency, is a sign that the engine will require an overhaul.

Oil Pump

The *oil pump* circulates the *engine oil* throughout the engine to provide lubrication. An *oil filter* helps to extend the life of the oil. The high temperatures and contact with exhaust gases will cause the oil to degrade over time. Diesel engines are expected to burn oil during normal operation, which will cause the oil volume to decrease over time. Since the oil helps metal parts to slide against each other, if there is not enough oil or the oil is old and dirty, the engine can be damaged or destroyed by friction.



*Tip: Ensuring that **oil is changed and topped off** on a regular schedule is the single most important thing that a manager can do to maintain the life of the utility's engines.*

➤ Switchgear and Controls

Switchgear

The switchgear provides control and monitoring of all power generation functions. Depending on the age and complexity of the switchgear, the powerhouse will be more or less automated. Switchgear can be fully manual units, where the operator will be responsible for selecting, starting, and synchronizing gensets. Or the switchgear can be fully automated, where no input is required from the operator in normal operation. In general, fully automated switchgear is more efficient, but requires greater technical know-how to troubleshoot and maintain. Data is available through the switchgear, including the running kW load, the voltage and amperage for each phase. Depending on the type and age of switchgear, the data will either be found on mechanical dials or through the operator information unit (OIU) or human machine interface (HMI), a computer interface that can be set up to provide a vast array of operational parameters. Other meters may be available based on the community's infrastructure. If there are wind turbines, hydro or solar panels, there will likely be meters similar to the totalizing meter.

Programmable Logic Controller (PLC)

As the load increases, the Programmable Logic Controller brings a larger generator on line and takes the smaller unit off. As the load decreases and/or additional generation sources are brought online (such as wind turbines or solar panels) the PLC brings a smaller generator on line and takes the larger unit off. The system automatically parallels multiple generators to the bus for a smooth and seamless transition of power from one unit to the

next. Any combination of generators can be operating in parallel to meet an extreme high peak demand. The system will automatically share load between the generators.

Demand Control

Advanced switchgear containing a **programmable logic controller** (PLC) are capable of operating any combination of generator sets in parallel, monitoring the load on the system and selecting the appropriate and efficient generator to operate.

Genset Controller

In fully automated switchgear, each engine is controlled by a **genset controller** (commonly referred to brand names such as GCP or EZGN), starting an engine and synchronizing the generator when requested by the switchgear's PLC. The genset controller also monitors the engine functions such as temperature and oil level, automatically shutting down a unit in the event of a problem.

Bus Meter

Also known as the **totalizing meter**, the bus meter tracks the kilowatt-hours of electricity generated by the diesel gensets. Calculations based on this meter is the value reported as "Diesel kWh Generated" to AEA monthly and to the RCA annually for PCE reimbursement.

SCADA

Supervisory control and data acquisition (commonly referred to as **SCADA**) offers another way to access the data available through the switchgear. If the SCADA is set up properly, it can be used by external consultants and AEA to help troubleshoot generation issues, saving time and money to travel to the community.

Station Service

All AC power for the plant is provided from the main bus and recorded in the **station service meter**. **The calculation from this meter must be reported to AEA monthly and the RCA annually.** The station service electrical system provides power for operation of everything at the plant including interior and exterior lights, receptacles, battery chargers, fans, and pumps. Since all power consumed as station service must be produced by the powerhouse, the utility should aim to make the powerhouse run as efficiently as possible.

Using high efficiency LED lights, using variable-frequency drives (VRDs) on pumps, turning off unnecessary lights and appliances when not in use, and other behavior or technology changes could save the utility money. Reducing station service saves diesel which in turn saves customers money.

➤ Step-Up Transformer

After the power leaves the powerhouse, it goes to the step-up transformer, which raises the voltage to the distribution voltage. The voltage is increased because it is more efficient to distribute power at high voltages. One important thing to note about the step-up transformer is that it will have a limit for the amount of power (in kilowatts or megawatts) that it can deliver to the grid. If the power transmitted through the step-up transformer goes above its rated capacity for too long, it can be damaged or potentially be destroyed. For instance, if a powerhouse has three gensets with a total capacity of 350 kW, but the step-up transformer is only rated to 150 kW, the utility needs to be careful not to overload the step-up transformer with too much power.



Tip: *If the community's peak load is near to or is greater than the rated capacity of the step-up transformer, it would be recommended to upgrade the transformer.*

➤ Distribution

The distribution system delivers power to customers on distribution lines, which can be either aboveground or belowground. Before power is delivered to customers' meters, the distribution voltage is decreased by a step-down transformer to 220V. Most customers will only receive single-phase power, although some larger commercial and industrial customers will receive three-phase power. In order to maximize the generation and distribution efficiency and limit any potential damage to equipment, customers should be spread across each of the phases to balance the load on each phase; otherwise, there will

be a phase imbalance. The voltage and amperage on each phase should be regularly assessed to see if the system needs to be rebalanced.

It is critical that all components of the distribution system are in safe condition and reliable. For instance, the manager should be certain that distribution lines are out of the reach of people, high voltage boxes are locked, and other safety measures are in place to protect curious children and adults. Safety codes need to be followed.

In addition to safety concerns, the distribution system can be a source of service disruptions and reduced efficiency. For instance, making sure that lines are stable and not overgrown by trees can decrease the risk of downed power lines, unexpected grounding, or other risks to the utility. Physical losses of energy in the distribution system — caused by ground faults, improperly sized or failed transformers, or arcing — and waste fuel can also be safety concerns.

SAFETY FIRST!

- Distribution lines are out of reach
- High voltage boxes are locked
- Safety codes are followed
- Lines are stable and free of trees
- Physical losses of energy in the distribution system are addressed
- Waste fuel is stored properly

➤ Customer Meters

The utility ends at the customer meter, which measures the kilowatt-hours consumed by the customer. It is at the meter that the utility will be able to recover the costs of generating and distributing power but **only if the meters are accurate and are read accurately.**

Meters can go bad. It is also very easy to read a meter incorrectly. See Chapter 7: Meter Reading for more tips and information about meters. If the electric sales to a customer do not seem to be reasonable, it is possible to test the accuracy of a meter. The first thing to check is that some meters have a multiplier that needs to be applied to the reading. A

CT (current transformer) meter is a type of meter installed on high load customers that may require that the reading be multiplied by a factor to get the actual consumption. As these multipliers can be different for each CT and/or building, please refer to the meter manufacturer for how to calculate the multiplier. Meters are inexpensive. **It may be cheaper and easier to replace a suspect meter than to check to see if it is faulty.**

Chapter 14: Safety

Section Contents:

Assessing the Safety of Your Power Plant

Safety Rules for a Utility

Utility Manager Responsibilities

Safety Incidents

Fuel Leaks / Spills

Risk of Catastrophic Failure

Fire Hazards

Be Aware, Be Prepared

Perhaps the single most important part of your job is making sure that your powerhouse, workers and residents are safe, 24 hours a day, 365 days a year. Safety is a habit. Safety needs to be at the front of your mind at all times because your community needs your powerhouse, and accidents can happen at any time. This chapter will provide you with some important reminders and safety issues to think about, but **this is only a start.**

Creating a safety-first culture is something that must come from the leaders at your utility. Everyone pays attention to the attitude that leaders exhibit toward workers' safety. **Workers need to know that their safety and the safety of others is THE most important consideration at the powerhouse and that they will always be supported if they put safety first.**

The utility is legally and morally responsible for protecting the public and employees from potential harm from the utility's infrastructure and operations. Although the powerhouse will not be occupied at all times, it is important that it is a safe place to work and that any risks to the utility are minimized.

➤ Assessing the Safety of Your Power Plant

- What hazards are in and around my powerhouse?
- How can we make every building and every operation safer?
- What training do employees need to do their best work in the safest possible ways?
- How do we protect and care for our equipment?
- What maintenance tasks need to be performed every year? Every month? Every week? Every day?
- Do we have exposed wires that need to be repaired or replaced?
- Are all of our fire alarms and carbon monoxide detectors working properly? When did we last test them?

➤ Safety Rules for a Utility

Safe design and installation: The utility must be certain that any new major redesigns or new infrastructure is designed and installed in a manner consistent with state and federal regulations and national codes and best practices. The State of Alaska Division of Fire and Life Safety (Fire Marshall) is responsible for ensuring that the powerhouse, fuel storage tanks, and/or other buildings comply with applicable fire and life/safety rules.

Unless they provided funding for the infrastructure's design and construction, no state or federal agency has the authority to enforce other safety standards for utilities. Per state law (Sec. 18.60.580), it is expected that a utility will follow the National Electricity Safety Code and the National Electrical Code. Appropriate signage and labels should be included for any potentially dangerous components.

Safe operations: Like all other business, utilities are legally responsible to provide workers with a safe working environment. It is common sense that people should not be put at unnecessary risk of being hurt while performing their job. Utilities work with a number of potentially dangerous substances: electricity, diesel fuel, and cleaning products can all be dangerous. Many utility workers must perform work around moving machinery, be in enclosed spaces, handle hazardous substances, and other potentially hazardous situations.

The first step for safe operations is to **make sure that utility personnel are adequately trained**. Personnel should recognize the limits of their knowledge and training, and receive

assistance if they are unsure that they are doing something safely. AEA's Circuit Rider program and private contractors are available to provide assistance for training and assistance in the safe operation of the infrastructure.

The utility manager should work with employees to make sure that everyone understands the importance of workplace safety. The Alaska Department of Labor and Workforce Development has resources, including the checklist provided in the back of [The Manager's Handbook, A Reference for Developing a Basic Occupational Safety and Health Program for Small Businesses](#), that can assist the manager in developing a safe work environment. The Alaska Division of Occupational Safety and Health is also available if the manager needs additional help.

All utility personnel should know and understand the utility's safety rules required by law and regulations; the utility manager must enforce the rules, either through incentives for complying with the rules or penalties for not following the rules. The manager should also track all safety incidents, both for employees and for the public, to make sure that utility safety policies are effective.

Inspect and maintain infrastructure: The manager must provide a number of checklists and methods that will help safeguard the utility. By performing regular inspections and routine maintenance, the utility should be able to avoid most potential safety issues. If the manager creates a system that prioritizes routine and non-routine maintenance for life, health, and safety issues, the utility will be able to protect workers and the public effectively.

Insurance: Always. Have. Insurance! Even if you are the safest utility on planet Earth, something could go wrong at any time. Insurance is your friend. Insurance can be the difference between a catastrophic event and a minor inconvenience, if and when something does go wrong. Make sure your policies are up to date and they cover all the areas that you might need help with, in the event of a fire or accident or injury. Keep your insurance paperwork in a safe place, and keep backups or extra copies someplace safe, as well. Protect your workers, protect your community, protect yourself – now and always – with insurance!



➤ Utility Manager Responsibilities

Ensuring Safe and Reliable Power

While the manager will not be solely responsible for running all aspects of the utility, the manager must provide the support necessary for employees to be successful in delivering safe and reliable power at a reasonable cost to the customer. This means that the utility must:

- have sufficient staff to cover the workload,
- provide personnel with explicit roles and responsibilities,
- provide opportunities for personnel to have adequate training to be successful, and
- provide a safe working environment.

In order to make informed decisions on how to improve utility operations, the manager needs access to current, high quality, and meaningful information about the utility. By ensuring that inspections and regular maintenance is performed routinely, the manager can make better assessments about the utility's needs, what non-routine work should be performed, and if the work can be done in-house or should be contracted out.

Training Your Staff for Safety

What does it take to run a safe and efficient utility? **First things first, you need good staff.**

A utility needs access to qualified personnel to complete utility tasks safely and competently. Having qualified personnel begins with hiring enough people with the needed skills and time to cover the utility's workload, and if a perfect candidate cannot be found, the utility must be willing to find and provide training for staff.

It is suggested that the utility have at least one person (with preferably a backup or itinerant position) to provide support that can and will accurately perform all of the inspections and routine maintenance covered in this chapter.

Especially if there are multiple staff at the utility, everyone should know their responsibilities. All personnel should have a job description with the roles and responsibilities clearly explained. Monthly and weekly schedules will help all employees to know what they should be working on within that period, particularly if jobs are shared. All inspections and routine maintenance should be planned ahead of time to ensure that the necessary materials and supplies are available. Even if all inspections and routine

maintenance is done properly and timely, a certain amount of flexibility is needed to be able to take care of events that cannot be controlled by the utility, such as storms or floods.

The manager will need to check in with employees about their work on a regular basis to see if additional support or correctional action is needed. All aspects of utility jobs require some oversight from the manager to ensure that tasks are completed properly. There should be no unnecessary tasks at a utility.

Many books, courses, and websites can provide advice on getting the most out of the utility personnel. While effectively managing employees so that they can perform at their best and stay at the utility requires an understanding of what motivates each employee, some general suggestions can be used as a starting point.

On-the-job training (OJT)

If the utility already has experienced or retired staff, the most effective training is on the utility's own equipment. If a utility is able to plan for personnel changes, OJT can be implemented effectively as part of job sharing or as experienced staff starts to transition out of the utility.

All new employees need to be trained on utility policies, so that everyone understands the uniform procedures that must be followed. Existing employees should be trained if policies are changed or are not being followed. It is also advised that all employees have some cross training so that each part of the utility understands what the other parts do and how each correlates with the other. For example, the utility operator should understand why it is important that accurate meter readings are provided to the utility clerk and how the clerk or manager uses that information to report to the PCE program. No matter the role, all utility jobs help to maintain the operational and financial viability of the utility.

AVTEC

The Alaska Vocational Technical Center (AVTEC) in Seward provides training for power plant operators in collaboration with the Alaska Energy Authority. In most years, AVTEC offers a Power Plant Operator (PPO) course and an Advanced Power Plant Operator (APPO) course. The PPO course is eight weeks and provides a nationally recognized certificate upon successful completion. The APPO course is three weeks. Dependent on

funding, the tuition and room and board for the PPO and APPO courses are usually covered by AEA. Please contact AEA at (907) 771-3000 for more information about the training programs.



Tips for Promoting a Safety-First Culture

- An employee should have their work recognized for the value it brings for the utility and the community that they live in. Even low-cost forms of recognition, such as hats and jackets, can instill a sense of pride of a job well done.
- The utility should help the employee be successful by providing training in the skills necessary to perform their job. The employee should not have disincentives for attending training—such as losing pay for attending training.
- An employee should understand the expectations of the position and receive timely and constructive feedback on their job performance.
- If the employee performs well or receives additional training, they should be eligible for incentive pay (bonuses) or raises as their skills improve. An employee's pay should not decrease as they become more efficient and effective at their job. At a minimum, employee's compensation should keep up with inflation.
- Managers should listen to and act on employees' suggestions if they are in the utility's best interest.
- If an employee is not performing adequately and positive motivation tools are not effective, the manager can impose negative consequences, including firing the employee and hiring a new person.
- The utility manager must budget the time and money to improve the employees' skills. All training expenses can be recovered through rates and are reimbursable by the PCE program.

Circuit Rider

For complex repairs that are beyond the expertise of the local operators, the Alaska Energy Authority (AEA) offers technical support through its Circuit Rider Program. The extent and type of support is dependent on the utility's needs and funding availability. Circuit Riders can provide remote support by the phone for troubleshooting issues, on-site training for personnel on the utility's infrastructure, and/or on-site support for minor maintenance. [AEA's Circuit Rider program](#) can be contacted at **1-888-300-8534**.

Electronic Materials

AVTEC and the AEA have prepared a Supplemental Training Resource Guide. This guide contains training materials in a video format on two CD-ROM's. It is useful for both introductory training and as a refresher course. There is also a similar CD-ROM video resource available for bulk fuel systems. Copies of the CD-ROM's can be obtained from AVTEC or AEA. The videos, over 70 in total, are also available through AEA's YouTube channel.¹

In all cases, personnel should know the limits of their training and knowledge, especially if there is a safety concern. If an employee is not qualified to perform certain tasks, the manager should get outside assistance. This could include remote or on-site support from the Circuit Rider program, hiring a contractor, or contacting a nearby utility to get advice.

➤ Safety Incidents

Ensuring that the utility is operating safely both for workers and the public should be the first goal of the manager. Per state regulations, a utility must keep a record of all accidents involving the utility and resulting injuries to the public.² Like other businesses, if a utility has more than 10 workers, the utility must report injuries and illnesses to OSHA using

¹ <https://www.youtube.com/channel/UCVrd6OX8Wg4e8yHwhXd-SyQ/videos>

² 3 AAC 52.480(c)

OSHA's form 300.¹ For utilities with fewer workers, worker injuries must be reported to the Division of Workers' Compensation using Forms 07-6100² and 07-6101.³

In addition to the reporting requirements, it is only by recording and tracking potential issues that the utility will be able to make sure that the risk of injury and property harm is as low as possible.

An example of a simple safety incident log follows. Setting up the table as a spreadsheet and recording the date will allow the information to be easily tracked by month and year. A board might be interested to know if the incidents involved utility workers or the public, so that is another column of info that could be tracked. The manager should want to know the cause of the incident so it can be prevented in the future.

Safety Incident Log

Safety Incident Log						
Incident #	Date & time of incident	Description of incident	Cause of incident	Public/ Worker	Severity of incident	Cost of incident

If the utility has an effective safety policy, the number of incidents should decrease over time. If the number of incidents increases, the utility's policies and training need to be reevaluated. The utility can receive assistance from the State Division of Occupational Safety and Health in evaluating workplace safety policies.⁴ Depending on what level of detail or the types of issues that the utility sees, it might be useful to separate incidents that involve workers from incidents that involve the public.

¹ <https://www.osha.gov/recordkeeping/RKforms.html>

² <http://labor.alaska.gov/wc/forms/wc6100.doc>

³ http://labor.alaska.gov/wc/forms/wc6101_Crosswalk.doc

⁴ <http://labor.state.ak.us/lss/oshhome.htm>

➤ Fuel Leaks/Spills

The utility also has an obligation to protect the public and community from fuel contamination. By law, all spills must be reported to the Department of Environmental Conservation. Records are very important to know what issues have arisen in the past. They can be used to document an ongoing infrastructure need. If infrastructure issues were to blame, the records can be used to show a need for assistance with the infrastructure. If the spills and leaks have been because of human error, then these records provide further justification for providing training to personnel.

Fuel Leak/Spill Log

Fuel Leak/Spill Incident Log					
Incident #	Date & time of incident	Description of incident	Cause of incident	Estimated gallons spilled	Cost of incident

➤ Risk of Catastrophic Failure

Utilities can be at risk of catastrophic failure from a number of sources, both environmental and human-caused. The most common cause of power outages in utilities is from downed trees. Other common causes are stress put on power plant components during times of peak load, and the weather. Snowstorms, rainstorms, high winds, lightning all of this can cause a power outage. With aging infrastructure and/or changes in the physical environment, the utility needs to remain vigilant in keeping track of potential issues that will cause widespread and long-term outages. One of the most important uses for the daily inspections is to spot potential issues that could cause long-term problems. The utility should also use the expertise provided by AEA's Circuit Rider program and any contractors to understand what potential issues can and may arise. Any and all issues that pose a risk of catastrophic failure should be submitted to the Work Order system. The utility manager will need to be able to track and effectively prioritize potential risks.

Power outages can cause many problems for the residents of a community. In addition to loss of electrical lights and heat, residents may lose food stored in their freezers. In rural Alaska with subsistence hunting and fishing, residents could lose a year's food supply.

Runway lights would be inoperable preventing landing of planes arriving with mail and prescription medicines. Power outages are so much worse in a rural community.



➤ Fire Hazards

The risks associated with a fire at your powerhouse are dire and real. Fires can be incredibly destructive and dangerous. Often, a fire will start quietly, when no one is around, and then quickly become a powerful, deadly force that has the potential to do tremendous damage to your powerplant and your community. The single best way to handle a fire is to prevent it before it happens.

Be fire aware

Establish a culture at your powerhouse that is always prepared for the event of a fire. **Every person needs to know what to do if a fire breaks out.**

- Place at least one fire extinguisher in every room, and make sure that everyone at your powerhouse knows where they are located and how to work them.
- What is your evacuation protocol? In a fire, seconds mean lives – so every second counts.
- All exits should be clear and clearly marked, and emergency lighting must always be in good working order.

Cleanliness Counts

To be safe, your powerhouse needs to be clean.

- Every day, all personnel must make sure that all ignition sources and flammables (e.g., oil, oil-soaked rags, fuel, etc.) are properly contained and separated.
- Repair or replace any faulty wiring immediately.

Know How to Put Fires Out if They Start

Buildings may have a number of systems to detect or suppress fires. **The manager must know what systems exist and how frequently they need to be checked.**

- Establish a routine at your powerhouse by assigning this task to a position.
 - For example, the Chief Operator will always be responsible for checking the fire systems. Make sure that the person responsible always notifies the Utility Manager of the results of this testing, even when the system passes all the tests.
- The Utility Manager and appropriate personnel should also evaluate if additional systems should be installed.
- Keep a folder handy with system manuals and maintenance guides.

Distribution Lines are Dangerous, Too

All components of the distribution system must be checked making sure that the lines are stable and not overgrown by trees.

- Look for downed lines or unexpected grounding.
- The distribution lines should be out of the reach of people.
- High voltage boxes should be locked.

Always Have Insurance

It's possible that your insurance company will offer a *discount on your premium* when they learn that you have appropriate fire suppression systems and protocols in place. Be sure to check with them and notify your bookkeeper to *verify that this discount is being applied* each time you pay for your policy. **Every penny counts!**

➤ **Be Aware, Be Prepared**

The bottom line whenever discussing safety issues is to be aware and to be prepared. Following is a list of ways to do this:

- Perform frequent inspections of the power plant and its distribution lines
- Take good care of all the electrical equipment and the power plant itself
- Keep trees or brush cleared away and trimmed so they do not interfere with distribution lines
- Follow all safety practices, laws and regulations
- Follow the weather. Be aware of incoming storms or high winds.
- Have a plan. Sit down with utility employees and write a plan for power outages.

Chapter 15: Inspections

Section Contents:

Internet, Cameras and SCADA

Daily inspections - General Plant, Switchgear and Generators

Power Plant Daily Inspection Logs 1 – 5

Monthly Inspections

Six-Month Inspections

Annual Inspections and Maintenance

Distribution System

It is unlikely that the utility manager will be responsible for carrying out daily or monthly inspections. The manager will, however, make sure that the inspections are done properly and on a regular basis. The daily inspections will provide most of the important information that the utility manager will use to make decisions for the utility.

To be effective, the manager needs to have a system so that any issues found in the inspections are dealt with quickly and correctly. The operators can fix some issues, but there will be other problems that will require the approval of the manager. It is also critical that the operations staff understand why each item inspected is important, and what the acceptable operating conditions and parameters are for each item. Schedule reoccurring operations meetings to discuss these inspection logs; how they might be improved; and how well they are understood.

Following are the recommended inspections for a utility's generation and distribution equipment. The inspection forms included are modified versions of inspection forms provided by AEA in the past and are divided into inspections that should be done daily, monthly, or on a half-yearly schedule.

These forms should be compared to the existing Operations and Maintenance Manual for the powerhouse, and any existing inspection forms in order to develop a form which meets the needs of your specific power house. In order to prevent confusion and aid in training new operators, the names used on the inspection log, and labels or tags used in the power house need to match.



Note: *If the Utility Manager or Operations staff would like assistance in making a utility specific Daily Inspection Log, the AEA Circuit Rider Program is available to support you in that effort.*

➤ Internet, Cameras and SCADA

The internet is helping to change the game on keeping property, plant and equipment safe and operating. Supervisory Control and Data Acquisition (**SCADA**) is a system of software and hardware elements that allows organizations to control industrial processes locally or at remote locations. Some utilities in rural Alaska have SCADA systems that monitor, gather, and process real-time data remotely. The contractor can be in Anchorage monitoring the utility's system. The contractor can alert the utility about potential issues and the utility can talk with the contractor about their concerns.

This SCADA and camera also act as a tool for the utility manager and the operators to monitor the condition of the powerhouse and control certain functions, both locally and remotely from the office or when the plant is not manned. Internet connectivity can significantly reduce contracted labor cost for travel, especially in diagnosis and in making changes in the multiple embedded controllers used in the powerhouse.

➤ Daily Inspections - General plant, Switchgear and Generators

Daily inspections are crucial to the long-term operations and success of the utility. The inspections should be performed by adequately trained personnel, and the manager should be informed immediately if anything needs to be fixed or improved.

The utility manager should be reading the daily inspection log frequently. The manager should:

- Verify that the daily inspection log is complete and accurate
- Verify that the operators initialed every log
- Immediately act on any concerns resulting from the inspection logs
- Sign the inspection log if it is complete and accurate
- Note any problems with the inspection log

At the end of the reporting period, the manager can calculate a simple percentage of fully complete and accurate inspections. If there were 25 fully complete and accurate inspections in a 31-day month, the percentage would be $25/31 = 80\%$. The manager needs to determine which employee/s are not completing the daily logs accurately and have a talk with them. **The manager should explain how important these logs are.**

➤ Power Plant Daily Inspection Logs 1 – 4

A Power Plant Daily Inspection Log is available in this chapter. This form can and should be customized for the utility. The utility's name should be added to the header, and if the utility has a logo, it should be added to the top left box of each page. There may be columns that are included on the inspection form that might not be needed for the utility, and they can be removed or blacked out on the form.

The inspection log includes the fields that engine manufacturers suggest tracking to plan maintenance and repair, and the logs have been compiled to assist utilities in tracking how well the infrastructure is working. If the utility uses another system that has been effective, then it should continue to use it.

The data that is needed for reporting to the PCE program have a light grey shading so that it will be easier for the utility clerk to find the required information on the form.

Before performing the inspections, the operator must know what range of values are appropriate for each item—this includes normal ranges for temperature, frequency, pressures, voltages, amps, etc.. Values that are outside of the normal range should be highlighted on the inspection log and will likely require some type of investigation. Depending on the utility's policies, the operator will typically fix, recalibrate, service, or

diagnose what is causing a reading outside of the normal range. **It is expected that inspections will be performed three times per day.**

Of particular importance to the utility manager, the operator should note on the inspection sheet anything that was fixed or serviced during the inspection. If supplies or materials were used during the inspection or repair, they should be included on the inspection sheet. If a problem still exists, or if the fix is likely temporary, the operator should notify the manager and submit a work order to provide a permanent fix, repair, or replacement. These will provide valuable information for the manager to understand the current status of the utility's infrastructure and plan for the supplies and infrastructure that might be useful in the future.

Each day of the week a daily inspection should be performed, and the results of that inspection should be entered into the Power Plant Inspection Log. It is very important that the operator clearly writes the results of the inspection.

Generation Redundancy

On a daily basis, as recorded on the daily inspection log, the manager should make sure that the utility has **at least two sources of generation** that can provide the community power. Having generation redundancy will make sure that the community will not have an emergency if one generation source becomes inoperable, either due to scheduled maintenance or from some other issue.

At the end of each reporting period, the manager should record whether there is or is not sufficient generation redundancy.

Power Plant Daily Inspection Log

Plant Status 1 of 4

Page One of this log deals with the Plant Status. It lists the following items for the utility operator to inspect and log:

Time: Log the time of the inspection. Make sure to note whether it is a.m. or p.m.

Operator Initials: The operator performing the inspection should clearly enter their initials

Outside temperature is included because it can be a key diagnostic value.

Inside temperature: The normal range should be between 60 and 75 Fahrenheit. If it is outside of the range, it could indicate an issue with the exhaust fans or engine cooling system.

Plant & site secure: To protect the utility and the public, all gates, doors, and windows should be secure. This can include normal wear and tear as well as vandalism.

Plant is sealed from the weather: Any leaks in the roof, broken windows, and holes in the floor or walls should be identified. While minor issues should be dealt with immediately, some damage may require a work order.

Exhaust color: A change in the color to black or blue could indicate an engine problem.

Intermediate tank secure: The utility has an obligation and financial interest to make sure that its supply is secure. This means that the fuel is protected from theft and there are no fuel spills. Spilled diesel can harm fish and wildlife, resources a community relies on throughout the year. Although it may not seem that a fuel leak or drip may be a big deal, small consistent leaks can turn into a lot of lost product and it is a very expensive project to clean up contaminated soil and/or water.

Intermediate tank level (gallons): Unless there is a meter on the intermediate tank, the operator will likely need to dip the tank. Since running out of fuel can damage equipment and cause service disruption, make sure that the tank is refilled before it falls below 20% of its capacity.

Gallons of fuel received in intermediate tank: On the days that the intermediate tank is filled, the number of gallons received should be recorded. All other times it should be recorded as zero. After allowing the fuel delivery to settle, the operator should also check for and drain any water found in the tank.

The operator should check the day tank. The Day Tank should be between ½ and full, the filter bowl is checked and clean, there are no leaks in the piping inside or outside of the powerhouse.

Record the Day Tank Meter Reading (gallons). If the utility does not have a fuel meter for the day tank, it should invest in one. It would be very difficult to effectively monitor the utility's operations without having an accurate reading for the amount of fuel consumed by the powerhouse, and it is required for participation in the PCE program. Even if the powerhouse has the day tank meter connected to the SCADA system, the operator should still read it from the meter so that any potential leaks can be spotted.

Oil Blender Status: If the powerhouse has a used oil blender, the operator should determine if the operation is in Oil Blender Status. The oil level in the hopper should be checked visually, and all the filters, pumps, and piping should be checked for leaks.

Check radiator status: The radiator should be free of debris and not be leaking.

Power Plant Daily Inspection Log Page 1 of 4

[Insert Utility Name]

POWER PLANT DAILY INSPECTION LOG Page 1 of 4 GENERAL PLANT STATUS

[Insert utility logo here]	Time	Operator initials	Outside Temperature	Inside Temperature	Plant & Site Secure (fence, doors, windows)	Plant is sealed from weather	Exhaust Color (C=Clear, BL=Blue, BK=Black)	Intermediate Tank Secure (no leaks, valves secure, etc.)	Intermediate Tank Level (gallons)	Gallons of fuel received in intermediate tank	Day Tank Normal (power on, no alarms, filter clear, no leaks, level OK)	Day Tank Meter Reading (gallons)	Oil Blender Normal (power on, no alarms, no leaks)	Radiator status OK (Free of debris, no leaks)
Expected value				60-75F	Y/N	Y/N	Clear	Y/N			Y/N		Y/N	
Monday														
Date:														
Tuesday														
Date:														
Wednesday														
Date:														
Thursday														
Date:														
Friday														
Date:														
Saturday														
Date:														
Sunday														
Date:														

Note: Perform complete inspection at least one time per day and walk through with meter readings at least two times per day.

Fuel Loss

Detecting a fuel spill may be very easy—there may be visible product on the ground or sounds of spraying fuel. Other indications may include a sheen of fuel on water or smell of fuel in the air. Dead vegetation around a facility or fuel line, or dead/oiled animals is the sign of a large or ongoing issue. If there are clear indications of deaths of animals, the public should be informed, and the community’s water should be checked. In some cases, the loss might not be easily detected. Because of this, it is particularly important that the utility has an accurate fuel inventory. If the inventory does not reconcile, it is a possible sign that there is a fuel spill or fuel has been stolen.

If a leak or spill is detected, it must be reported to the nearest Alaska Department of Environmental Conservation office (during normal work hours) or call 1-800-478-9300 after normal working hours. If the utility is not the tank owner, contact the tank owner or manager.

Additional information about the safe operation of bulk fuel facilities can be in AEA’s Rural Bulk Fuel Facilities Operator Handbook and the Alaska Department of Environmental Conservation Aboveground Storage Tank Operator Handbook.

Rate	Gallons Lost per Year	Contaminated Soil (Tons)
1 drop/10 seconds	40	150 tons
1 drop/5 seconds	80	300 tons
1 drop/second	410	1,500 tons
3 drops/second	1,200	4,500 tons
Stream – Breaks into Drips	8,600	32,000 tons

Power Plant Daily Inspection Log

Plant Status 2 of 4

Cooling system status. The coolant temperature and coolant pressure should be within the expected ranges, and there should be sufficient but not too much glycol in the expansion tank based on the system specifications. The radiators and all piping should be inspected for leaks.

Cooling system temperature—Supply and Return: The temperature for both the supply and return should be recorded in case there is a fault with the cooling system. There should be approximately 20-degree Fahrenheit difference between the supply and return temperatures.

If the power plant has a heat recovery system, record the information for the following items:

Heat recovery system status: The glycol pressure should be within the expected ranges, and there should be sufficient but not too much glycol in the expansion tank based on the system specifications. The radiators and all piping should be inspected for leaks. It should be noted that belowground systems might have water instead of glycol.

Heat recovery temperature—Supply and Return: The temperature of the supply and return should be recorded both to ensure that the system is operating adequately and that the meter reading is accurate. There should be an approximately 20-degree Fahrenheit difference between the supply and return temperatures.

Heat recovery flow (gpm): If there is a flow meter on the heat recovery system, record the current rate of flow in gallons per minute (gpm). If the heat recovery system should be operational, but the flow is lower than expected, the system should be checked.

Heat recovery meter reading (Btu) must be done regularly so that the utility can receive the income from the heat sales. Depending on the type of meter, the amount of heat delivered in Btu can be read off the meter. Otherwise, a calculation might be needed that includes the total amount of fluid flow and the temperature differential between the inlet and outlet of the heat recovery system. The meters should include instructions on how to interpret the values.

Room lights: Verify they are working. **Ceiling & exhaust fans:** Verify they are working.

Red pilot light: Verify switches are on. **Fire suppression status:** Verify status is normal.

Fire extinguishers: Verify these are in place and charged.

Power Plant Daily Inspection Log Page 2 of 4

[Insert Utility Name]

POWER PLANT DAILY INSPECTION LOG Page 2 of 4 GENERAL PLANT STATUS

[Insert utility logo here]	Cooling system status (exp. Tank level, pressure normal)	Cooling system temperature--Supply	Cooling system temperature--Return	Heat recovery status (pumps on, pressure normal)	Heat recovery temperature--Supply	Heat recovery temperature--return	Heat recovery flow (gpm)	Heat recovery meter reading (Btu)	Room Lights working	Celing & exhaust fans working	Red pilot light switches on	Fire suppression normal	Fire extinguishers (in place & charged)
Expected value	Pres=	Temp=	Temp=	Pres=	Temp=	Temp=			Y/N	Y/N	Y/N	Y/N	Y/N
Monday Date:													
Tuesday Date:													
Wednesday Date:													
Thursday Date:													
Friday Date:													
Saturday Date:													
Sunday Date:													

Note: Perform complete inspection at least one time per day and walk through with meter readings at least two times per day.

The Basics of Switchgear

For those who don't know, electrical switchgear (sometimes just called 'switchgear') is a fairly broad, generic term that includes a variety of switching devices used to protect your power system from overloads. By extension then, the definition could also include devices used to regulate, meter, and control your power system. The switchgear also displays most of the key data for the utility's operation. Depending on the age and type of switchgear, the data might be displayed with analog dials or through a computer screen.

Switchgear protection is very important to the generation of power, to transmission and to distribution. In all these areas of your power plant there is the possibility of overload. If overload were to happen and there was no switchgear in place, there can be huge problems leading to the burn out or destruction of your expensive equipment.

That's why a daily inspection of this system is so important!

Power Plant Daily Inspection Log

Plant Status 3 of 4 (Switchgear)

Make sure the switchgear is in auto mode. There should be no switchgear alarms or faults. Any alarms or faults must be addressed as quickly as possible to ensure proper operation of the utility.

Total Diesel kWh generated will be found on the main bus meter or the totalizing meter.

Station service meter reading in kWh should be found near the totalizing meter. This includes all the power consumed in the powerhouse. The monthly Power Cost Equalization report sent to the Alaska Energy Authority requires total diesel kWh generated and total kWh used for station service for the reporting period. These figures are obtained by subtracting the readings at the end of the reporting period from the readings at the end of the previous reporting period. Even if both of these meters, the bus meter and the station service meter are available through the utility's SCADA system, the operator should read the values from the plant meters so that other potential issues in the powerhouse might be spotted during the walk through.

Running kW load is included as a way to check to make sure the correct engine is running. As mentioned earlier, some switchgear will include logic for which generator is operating based on the running load. The switchgear should be set up to run the most efficient unit at any time; this should be checked daily to make sure that the correct engine is being selected.

Peak kW load will give the maximum power generated by the powerhouse. This can be reset every month for reporting to PCE, as it is useful to know how to size any future generation capacity.

Frequency (Hz) should be between 59.5 and 60.5 Hertz. If it is on the low end of the range, or below 59.5 Hz, it is an indication that the engine is not able to meet the community's load. If it is above 60.5 Hz, it is an indication that there might be issues with the governor, frequency control, or that the engine is not properly responding to the community's load. High frequencies can also be caused by external generation (such as wind or solar PV) putting more power to the grid than can be consumed at the time. If this is the case, a secondary load or dump load may be needed to provide frequency response to the system.

The voltage and amperage need to be recorded for each phase (Line A-B, Line B-C, Line A-C Voltage and Line 1-3 Amps). In the best-case scenario, the voltage and amperage should be equal across each line. At a minimum they should be within 5% from the lowest to highest number. The baseline voltage will depend on the generator make and model.

Power factor is the ratio of real electrical power flowing to the system to the apparent power generated. It is determined by dividing the kW by kVA. To understand powerhouse generation efficiency, it helps to understand actual and apparent power.

- **Actual power** kW (kilowatt) is actual power. It is the amount of power that is converted into an output.
- **Apparent power** kVA (kilovolt-amperes) is apparent power. It is the total amount of power being used by a system. In a 100% efficient system kW would equal kVA exactly. In reality, electrical systems are not 100% efficient and so not all of the system's apparent power is being used as output.
- A power factor of 1 is the ideal condition, where all power generated is consumed. A power factor below 1 means that the load draws more current than needed. The cause is that the voltage and current waves are not in phase. In most rural Alaska communities, the power factor should be between 0.8 and 0.9. If the power factor is out of this range, an expert should be brought in to analyze the system. Diesel generators have a power factor of 0.8. Electrical efficiency is usually expressed as a power factor between 0 and 1, therefore the closer the power factor is to 1, then the more efficiently the kVA (kilovolt-amperes) is being converted into actual kilowatts. This means that all the power generated is being consumed.

Powerhouse Efficiency: Newer powerhouses with AEA SCADA will report this number. If not, the operator will likely need to do a calculation to determine the Generation efficiency (kWh/gal). The calculation will find the kWh generated since the last reading and then divide by the diesel consumed [subtract the current Day Tank Meter Reading from the previous reading]. This number can be used to help identify engine problems and should be monitored closely by operations personnel for engine health.

Power Plant Daily Inspection Log, Page 3 of 4 (Switchgear)

[Insert Utility Name]

POWER PLANT DAILY INSPECTION LOG Page 3 of 4 Switchgear

[Insert utility logo here]	Switchgear in auto mode & No alarms (if automatic switchgear)	Total Diesel kWh Generated (Totalizing or main bus meter reading)	Station service meter read (kWh)	Running kW load	Peak kW load (reset after reading)	Frequency (Hz)	Line A-B Voltage	Line B-C Voltage	Line A-C Voltage	Line A Amps	Line B Amps	Line C Amps	Power factor	Powerhouse generation efficiency (kWh/gal), if available
Expected value	Y/N					59.5-60.5 Hz							0.8-0.9	
Monday														
Date:														
Tuesday														
Date:														
Wednesday														
Date:														
Thursday														
Date:														
Friday														
Date:														
Saturday														
Date:														
Sunday														
Date:														

Note: Perform complete inspection at least one time per day and walk through with meter readings at least two times per day.

Power Plant Daily Inspection Log

Plant Status 4 of 4

Operating Generator will be used for all operational engine information. If there are occasionally two operating gensets, both numbers should be reported. If there are usually 2 or more gensets operating together, the inspection log for your utility should be revised to include additional space as required.

Total engine hours on operating engine is used to plan for future routine maintenance and Repair and Replacement activities.

Crank vent outlet venting properly is a yes/no response. If it is not venting properly, it should be fixed.

Engine water temperature should be between 170-180F. This is measured on or near the outlet pipe to the engine.

Engine coolant leaks which cannot be easily fixed after the inspection should be submitted through the Work Order system. Common places for these leaks are around the water pump, hoses, and connections.

Engine oil pressure typically reported on a gauge or display near the engine or engine control panel.

Oil leaks to fix: The engine should be checked for oil leaks to fix. Common sites of oil leaks are around seals and gaskets, especially the oil filter, valve cover, and turbocharger. Oil leaks which cannot be easily fixed after the inspection should be submitted through the Work Order system.

Engine oil level should all be within the expected ranges. The engines should be kept clean enough to be able to easily detect new leaks.

Engine oil added (quarts) is included because it is expected that a diesel engine will consume oil between oil changes, even if there are no leaks. One of the signs that the engine needs to be overhauled is that the rate of oil consumption increases.

Exhaust temperature range will be found on the engine technical specifications sheet. Excessively high or low temperatures indicate problems with the engine.

Crank engine battery voltage should be within the acceptable range based on the batteries

installed in the powerhouse. Since the battery is responsible for starting the engine and powering the switchgear, it is important that the battery is operational.

Number of Available Gensets should equal the number of gensets in the powerhouse that are available to run. If there are inoperable, or broken gensets, the problems should be resolved as quickly as possible using the Work Order system.

Operating Gensets indicates the number of gensets actually producing power during the inspection. If at any time the number of Operating Gensets is equal to the number of Available Gensets, the Utility Manager should prioritize repairing or replacing any inoperable gensets.

Available to Run Genset is any genset which is operable but not running. An Available to Run Genset being "Ready" indicates that the block is warm, there are no leaks, or alarms, battery is charged, and all routine maintenance is complete. Bringing a Genset online that is not "Ready" may cause an outage and/or engine failure.

Power Plant Daily Inspection Log, Page 4 of 4

[Insert Utility Name]

POWER PLANT DAILY INSPECTION LOG Page 4 of 4 Operating Generator

[Insert utility logo here]	Total Number of Gensets available	Operating Generator Number	Total engine hours on operating engine	Crank vent outlet venting properly	Engine water temp	Engine coolant leaks to fix (Y/N)	Engine oil pressure	Oil leaks to fix (Y/N)	Engine oil level	Engine oil added (quarts)	Exhaust temperature	Crank engine battery voltage	Offline engine status (block warm, no leaks, no filter alarms, oil level OK, battery charger on)	Comments, including Action Taken, Supplies Used, and Unresolved Issues
Expected value				Y/N	T=		P=						Y/N	
Monday Date:														
Tuesday Date:														
Wednesday Date:														
Thursday Date:														
Friday Date:														
Saturday Date:														
Sunday Date:														

Note: Perform complete inspection at least one time per day and walk through with meter readings at least two times per day.

Power Plant Inspection Log 5

Wind Power & Electric Boiler

The following list is commonly used by other utilities which generate power through Wind. The Utility Manager should compare this list to that which is found in your existing Wind Power Operations and Maintenance Manual, and any other existing checklists.



Note: *If the Utility Manager or Operations staff would like assistance in developing a utility-specific Daily Inspection Log for your Wind Facility, the AEA staff is available to support you in that effort.*

Note: If the utility has wind, hydro, or solar generation, there is additional data that will be included on separate daily inspection logs.

Number of Turbines Online: Count the turbines online.

Number of Turbines Offline: Count the turbines offline. If a turbine is offline and is not down for maintenance, the operator should find out why it is offline. Any alarms and error codes should be noted. If it is discovered that the offline turbine has a problem, a Work Order should be developed with a plan to fix it.

Number of Turbines Curtailed: This is not in the daily inspection log. If a turbine is curtailed, the operator should find out why. Any alarms and error codes should be noted. A Work Order should be developed with a plan to fix it.

Wind Total kWh Generated will be found on what might be labeled the meter for the wind farm. Depending on the age and type of switchgear, the data might be displayed with analog dials or through a computer screen. By performing a calculation on the Wind Total

kWh Generated, (subtracting the reading at the end of the reporting period from the reading at the beginning of the previous reporting period) this data should be used to report to AEA for Power Cost Equalization.

Running kW Load is the performance of the turbines over the reporting period and can be estimated by the *Average running kW* and *Average wind speed* for the reporting period. The output (in kW) from the wind farm should be close to what is expected at the wind speed.

Wind Speed (ft/s): To know if the wind turbine is operating to expectation, it is important to track the wind speed. After checking the actual output of the wind turbine versus what is expected at different wind speeds, the utility may need to determine if there are improvements or changes that can be made to improve turbine performance.

Electric Boiler in Powerhouse Total kWh: If the wind farm has a secondary load, load bank, or electric boiler to deal with excess production, the *Electric Boiler Total kWh*

Electric Boiler Running kW Load should be recorded to make sure that it is running properly.

Alarms: Any alarms on the turbines should be noted and dealt with appropriately.

Turbine operating within normal range: All systems should be evaluated to ensure that they are within normal range. If there are systems out of the normal range, they should be dealt with appropriately.

Turbine wiring normal: While it may not be inspected on a daily basis, the wiring should be checked regularly

Tower and foundation stable: Especially in areas of thawing permafrost or unstable ground, the stability of the foundation should be assessed. At a minimum, the tower should be visibly stable and vertical. Any settling or leaning of the tower can lead to catastrophic problems.

Power Plant Daily Inspection Log – Wind Power and Electric Boiler

[Insert Utility Name]

POWER PLANT DAILY INSPECTION LOG Page 1 of 1 Wind Power & Electric Boiler

Community	Number of Turbines online	Number of offline turbines	Wind Total kWh Generated	Wind Running kW load	Electric Boiler in PH Total kWh	Boiler Running kW Load	Wind Speed (ft/s)	Alarms	Turbine operating within normal range	Turbine wiring normal	Tower and foundation stable	Comments, including Action Taken, Supplies Used, and Unresolved Issues
Expected value								Y/N	Y/N	Y/N	Y/N	
Monday												
Date:												
Tuesday												
Date:												
Wednesday												
Date:												
Thursday												
Date:												
Friday												
Date:												
Saturday												
Date:												
Sunday												
Date:												

Note: Perform complete inspection at least one time per day and walk through with meter readings at least two times per day.

➤ Monthly Inspections

Powerhouse & Fuel Supply

In addition to the daily inspections, a thorough inspection of basic systems in the power plant needs to be performed at least one time per month. The following list is commonly used by utilities. The Utility Manager should compare this list to that which is found in their existing Operations and Maintenance Manual, and any other existing checklists.



Note: *If the Utility Manager or Operations staff would like assistance in developing utility specific Monthly, Six Month, and Annual Inspection Logs, the AEA Circuit Rider Program is available to support you in that effort.*

Switchgear Lamp Test: Check the annunciator lights on the switchgear (*Switchgear Lamp Test*). Replace any lamps that do not work.

Day Tank: The function of the day tank control panel should be tested by *Pressing to Test*. The intermediate and day tank should be checked for water contamination at least on a monthly schedule, or when it is suspected that water has gotten into the fuel system. A sounding tape with water finding paste should be used to detect water in the tanks. If water is detected, proper procedures for removing the water safely and disposing of the fluids should be followed.

Battery Fluid Levels: Should be inspected and distilled water used to bring the fluid up to the proper level.

Fluorescent Lights and Emergency Lights should be checked and replaced if needed. Replacing area lights with high efficiency LEDs or fluorescent lights will reduce station service.

Thermostats should be checked to ensure that the heating and ventilation equipment is working properly.

➤ Six-Month Inspections

Every six months several other things in the powerhouse need to be inspected. Refer to the Utility Operations and Maintenance Manual for additional discussion or descriptions.

Intake air filters need to be checked every spring and fall and more often during seasons with high levels of dust or insects so that the powerhouse gets sufficient airflow for both engine combustion and cooling.

Piping air vents are installed in the coolant and heat recovery piping and air needs to be bled periodically.

Test the glycol—engine cooling and heat recovery system for appropriate concentration and corrosion protection.

Wipe down lights & paddle fans

Check fuel tanks for water: Fuel tanks should be checked for water after every time that they are filled. Sufficient time should be given for any water to settle out of the fuel and it should be checked with a plumb bob and water-finding paste. In addition to these inspections, the tanks should be checked every six months.

Test thermostats (heat = 70F, ventilation = 80F)

➤ Annual Inspection and Maintenance:

In addition to the daily, monthly and half-yearly maintenance routines there are three additional procedures that need to be performed once each year. Refer to the Utility Operations and Maintenance Manual for additional discussion or descriptions.

The fire suppression system needs to be tested and re-certified each year. This must be performed by a qualified technician with proper certifications. Typically, a technician will be brought into a community each fall to certify the school fire alarm and/or fire

protection system. The most cost-effective way to re-certify the power plant fire suppression system would be to combine it with the school and use the same technician.

The high voltage (bottom) section of the switchgear should be inspected each year. This will require a planned outage to take the plant completely off line. Utility customers should be notified ahead of the planned outage. Make sure to record the planned outage on the outage log.

The heat recovery piping is equipped with strainers. These are primarily used to remove debris from the piping during system startup but should be checked and cleaned annually.

Monthly Inspections

MONTHLY INSPECTIONS

Monthly Inspections Date:	Switchgear Lamp Test (master & engines)	Day Tank: press to test	
	Battery Fluid Levels (distilled water only)	Fluorescent Lights (check & replace)	
	Emergency Lights (press to test)	Thermostats (heat = 70F, ventilation = 80F)	
	NOTES: Other actions taken and/or unresolved issues	Check fuel tanks for water	
Monthly Inspections Date:	Switchgear Lamp Test (master & engines)	Day Tank: press to test	
	Battery Fluid Levels (distilled water only)	Fluorescent Lights (check & replace)	
	Emergency Lights (press to test)	Thermostats (heat = 70F, ventilation = 80F)	
	NOTES: Other actions taken and/or unresolved issues	Check fuel tanks for water	
Monthly Inspections Date:	Switchgear Lamp Test (master & engines)	Day Tank: press to test	
	Battery Fluid Levels (distilled water only)	Fluorescent Lights (check & replace)	
	Emergency Lights (press to Test)	Thermostats (heat = 70F, ventilation = 80F)	
	NOTES: Other actions taken and/or unresolved issues	Check fuel tanks for water	
Monthly Inspections Date:	Switchgear Lamp Test (master & engines)	Day Tank: press to test	
	Battery Fluid Levels (distilled water only)	Fluorescent Lights (check & replace)	
	Emergency Lights (press to test)	Thermostats (heat = 70F, ventilation = 80F)	
	NOTES: Other actions taken and/or unresolved issues	Check fuel tanks for water	
Monthly Inspections Date:	Switchgear Lamp Test (master & engines)	Day Tank: press to test	
	Battery Fluid Levels (distilled water only)	Fluorescent Lights (check & replace)	
	Emergency Lights (press to test)	Thermostats (heat = 70F, ventilation = 80F)	
	NOTES: Other actions taken and/or unresolved issues	Check fuel tanks for water	
6-Month Inspections Date:	Switchgear Lamp Test (master & engines)	Day Tank: press to test	
	Battery Fluid Levels (distilled water only)	Fluorescent Lights (check & replace)	
	Emergency Lights (press to test)	Thermostats (heat = 70F, ventilation = 80F)	
	Intake Air Filters, (check & replace)	Wipe down lights & paddle fans	
	Piping Air Vents (coolant & heat recovery) bleed then valve off	Test glycol (coolant & heat recovery)	
	NOTES: Other actions taken and/or unresolved issues	Check fuel tanks for water	

➤ Distribution System

Since the distribution system is a major source of energy loss, reliability issues, and potential safety issues, the utility should consistently inspect the system and perform identified maintenance. Every kWh that is not delivered to a customer creates a cost that is not covered by income, and the unaccounted-for power could create an unsafe situation for workers or the public.

The distribution system inspection will be ongoing.

All overhead lines should be inspected on a three-year interval, and the utility should *inspect poles* at least every 8-10 years for decay and structural strength.

The Distribution Inspection Form provides a way for the utility to keep track of inspections on the distribution system. The operator or other personnel performing the inspection should have sufficient training to know what the distribution components should look like. The components are rated as Good, Maintenance Required, or Priority Maintenance Required.

The Utility Manager should compare this form to that which is found in your existing Operations and Maintenance Manual, and any other existing forms or checklists.



Note: *If the Utility Manager or Operations staff would like assistance in developing a utility-specific Distribution Inspection Form, the AEA Circuit Rider Program is available to support you in that effort.*

Distribution System Inspection Form

Distribution System Inspection Form																	Date:	Inspected by:	
MAP AREA	OVERHEAD							UNDERGROUND				EQUIPMENT					COMMENTS		
LOCATION	Pole Condition	Pole depth/vertical	Crossarm Condition	Insulators & Pins	Conductor & Ties	Guy & Anchors	Grounding	Trees near lines	Pad Condition	Signage & Locks	Conductor Condition	Grounding	Transformers	Cutouts	Arresters	Devices	Brackets	Conduit	Rating Criteria 0) Good Condition 1) Maintenance Required 2) Priority Maintenance Required

The form divides the distribution system into Overhead, Underground, and Equipment:

The Overhead columns include components (such as poles, cross-arms, insulation, conductor, guys & anchors, and grounding) that could wear out. If there are potential hazards for the lines, particularly trees near lines that could be affected by snow, freezing rain, wind, or rain, these need to be identified and dealt with appropriately.

The Underground section includes components (such as pad condition, conductor condition, and grounding), as well as safety considerations such as signage and locks.

The Equipment section includes transformers, cutouts, arresters, devices, brackets, and conduit that can affect the efficiency and safety of the distribution system.

The first time that the distribution system is inspected, the poles should be numbered and mapped so that it is easier to identify which areas need to be fixed.

As with the maintenance identified from the other inspections, the distribution system repairs should be included in the Work Order system so that they can be evaluated against the other needs of the utility.



Chapter 16: Inventory

Calculating Inventory Levels

Inventory to Support Utility's Assets

Sample Engine Parts and Supplies

Tools

Inventory Storage

Fuel Inventory Management

Monthly Computation of Fuel Inventory Loss

How much inventory does your electric utility need to keep on hand to support all of your assets? That is the big question to answer when a utility is setting up an inventory system.

What are the utility's assets? Listing these assets is a great place to start when building an inventory. You should already have a list of assets in a spreadsheet. This spreadsheet hopefully identifies the manufacturer of each asset, the description, and the age. In most cases, the manufacturer will list items needed to maintain the asset and other items to keep on hand in case of emergency. These items become your inventory. Go through each asset in your utility and make an inventory list.

Each inventory item should be identified with the following:

- Item Name & number
- Manufacturer Name, telephone & website
- Item Cost
- Suggested Quantity to Keep on Hand



➤ Calculating Inventory Levels

Calculating inventory levels is a balancing act. Too much inventory will tie up too much of a utility's money. Too little inventory will hurt the utility's ability to respond to repairing damaged assets. When thinking about the levels of inventory to maintain within your utility consider the following:

- Consider all of the different assets within your utility – generators, engines, load regulator – the list goes on, and all of these items have moving parts that can wear out and break.
- When were these items placed in service? How old are they?
- There is not a large hardware store in your community loaded with replacement parts.
- Could you borrow a replacement part from a neighboring community in an emergency? Would they have it? Would they loan it to you?
- Is your utility in an area of higher winds/storms, which can cause more frequent damage to your utility?
- Review the utility work order records to identify any other inventory needs.

An electric utility has two very important inventories to consider:

- One is the inventory of all the **supplies, materials and parts** needed for the day-to-day maintenance to support the assets of the utility. The other is the **fuel inventory** sitting in the tanks. A utility wants only the parts and supplies on hand necessary to be able to perform routine maintenance and to cover emergencies, and only enough fuel needed to last until the next fuel delivery.

➤ Inventory to Support Utility's Assets

To support the operator and protect the utility's assets, the utility manager needs to make sure that all supplies and materials are available to perform the required routine maintenance. A good inventory control system will protect the utility from purchasing extra or unnecessary things. An inventory control system will keep track of what the utility has on hand, what it has used in the past, and what it needs in the future. Since even good people sometimes make bad decisions, an effective inventory control system should make it difficult for people to spend utility money on non-utility purchases. This can be

accomplished by requiring two people to be involved in any utility purchase, one to authorize the purchase, the other to make the purchase. All inventories need to be protected by being in safe, secure locations protected from theft.

Inventory can be recorded either in a hand-written system, a computer database, or using an app through a smartphone or tablet. Numerous systems are available for utilities to use. The utility will want to find a system that is user-friendly and can be easily maintained by personnel.

A good time to make an inventory list is after looking at all of the inspection and maintenance tasks to be performed by the utility's operators. The manager should review with the operators all of the tasks identified in Chapter 15: Inspections and Chapter 17: Routine Maintenance. They should list the specific supplies and materials and the quantity needed for each task.

Added to this inventory should be the manufacturer's suggested inventory for maintaining equipment (assets) within the utility. Because everything kept in inventory ties up utility cash, **inventory stock should be kept to what is needed**. An item should be stocked only if a definite need for the item exists or if it will take too long to obtain the item if it is not in stock. Some items are infrequently used but may be **vitaly needed** in an emergency.

The appropriate quantity of items to be stocked will depend on many factors:

Usage patterns: How often do you use the item and how many do you use at a time?

Delivery time: How long does it take to order and receive the item?

Size: How much space does this item take up in your utility?

Availability: If a community receives most of its goods from a barge, and air freight is expensive, it may be a good idea to store enough inventory to perform all of the engine oil changes for the entire year. The decisions for each item in inventory must be made on a case-by-case basis.

What follows is a list of recommended supplies and materials that a utility should keep on hand. Your utility may have additional or fewer needs based on their own particular situation.

Engine

Engine oil
 Oil filters
 Fuel filters
 Coolant filters
 Water pump & gaskets
 Thermostat and gasket
 Set of injectors
 Belts
 Hose clamps
 Coolant hoses
 Turbocharger and gaskets
 Valve cover gasket
 Engine glycol
 Air filters

Powerhouse

Day tank fuel filter
 Heat recovery glycol
 Oil absorbent pads
 Air intake filters
 General cleaning supplies
 Distilled water

Distribution

Transformers
 Poles
 Primary conductor
 Splices
 Fuses
 Meters

Fuel System¹

Sounding tape
 Water finding paste
 Tank charts
 Lineman tool bucket & canvas
 Spill response kit
 Rags
 Absorbents
 Pole anchor reflectors
 #2 Crimpers
 Meter base locks

Safety Items

First aid kit
 Eye wash station
 Spill response kit
 Rags
 Absorbents

¹ And also see: <http://www.ak-energy.org/Portals/0/Programs/Rural%20Energy%20Assistance/Bulk%20Fuel%20Upgrade%20Program/AEARuralBlkFuelFacOpHndbook2018.pdf?ver=2019-06-19-140029-493>

Sample Engine Parts and Supplies *(work with manufacturers and technicians to develop a list for each of the utility gen-sets)*

Part or supply	Engine	Part # or type	Estimated unit cost	Number or amount to keep in stock	Reorder when stock reaches	Current in stock	Date of Last order
Engine oil	JD 6068AFM85	15w40, Delo 400, 10-13 gal		55 gal	25		
Oil filters	JD 6068AFM85	RE504836(filter) R502513(gasket)		10	3		
Fuel filters	JD 6068AFM85	RE527961 NAPA 3975		10	3		
Coolant filters	JD 6068AFM85	NAPA: 4070		5	1		
Water pump	JD 6068AFM85	RE527848		1	0		
Water pump gasket	JD 6068AFM85	R123417 and RE508566		1	0		
Thermostat	JD 6068AFM85	RE557215 (Need 2)		2	0		
Thermostat gasket	JD 6068AFM85	R522334		1	0		
Fuel injectors	JD 6068AFM85	SE501934(need 6)SE501934(6bolts)		6			
Belts	JD 6068AFM85			2	0		
Hose clamps	JD 6068AFM85						
Coolant hoses	JD 6068AFM85						
Turbocharger	JD 6068AFM85	SE502269		1	0		
Turbocharger gaskets	JD 6068AFM85	RE549173		1	0		
Valve cover gasket	JD 6068AFM85	R524497		3	0		
Air filters	JD 6068AFM85			5	1		
Engine Glycol		Extended Life 50/50 Premix		55 gal	0		

➤ Tools

A utility needs to have the correct tools available when a repair needs to be made. If tools are scattered throughout the power plant, it is difficult to keep track of them. It also sends a message to utility employees that the tools are not valued. Employees might decide to take them home and fix something or the tools may break with lack of care. When tools are first purchased, they should be inventoried. Just like a utility's large assets, tools should be tracked in a tool spreadsheet. When a tool is issued, a tool sign-out book should be kept to record tools issued and returned, the dates, and the user. Tools that are regularly used by operators on a daily basis can be permanently signed out to them.

Monitor Use and Restock

Over time, parts and supplies will be used in performing utility-related business. As the parts are consumed, the inventory should be updated. This can either be done on a continuous basis or by doing a periodic inventory. The daily inspection logs and engine maintenance logs all provide a space to record what parts and materials were used. This can be an easy way for the manager to update the inventory list. When maintenance and/or repairs are needed it is important that the utility have the necessary parts and supplies in stock. The following page provides an example Parts/Supply Request form that will also help Operators and other staff communicate needs to the Manager, and for the Manager to communicate with the Utility Board.

➤ Inventory Storage

The utility should have a separate dedicated locked room to store spare parts and tools. The utility has an obligation to protect its inventory both for safety and financial reasons. The utility likely has potentially dangerous (flammable and/or caustic) chemicals and tools that should be secured to reduce the utility's liability. A secure location to store the inventory will also protect the items from theft and damage.

The storeroom should be clean and dry and organized in a logical pattern with shelves and labels to make it easy to find materials, parts, and/or tools. Any dangerous, corrosive, and/or flammable materials and chemicals need to be stored properly. This includes both in the storeroom as well as on the job site.

➤ Fuel Inventory Management

Effective fuel inventory management is one of the most important jobs that a manager has. Fuel is frequently the largest line item in a utility's budget. Ensuring that there is an adequate supply and quality of fuel at all times is imperative for the functioning of a utility. Only by tracking fuel can the manager know if there is sufficient fuel to run the utility until the next fuel delivery. It is very important that the utility has a qualified person to inspect and manage the utility's fuel supply. Please see AEA's "Rural Bulk Fuel Facilities Operator Handbook" for additional information.¹

Running out of fuel is a catastrophic issue for a utility. It is important that the utility is able to forecast how much fuel will be consumed in the future and plan for the possibility of needing to get fuel delivered earlier than planned. The simplest way to do this is to track the fuel over time and make a prediction for future consumption.

Particularly if you've had emergencies in the past with running out of fuel, you should track your fuel levels and estimate how much time before you need to reorder fuel. The table below shows an example of how this could be done. After a new delivery of fuel you should record how much fuel was received and the total amount of fuel in the tanks (columns 1-3).

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Delivery Date	Gallons Received	Gallons on Hand	Fuel Burn Rate (gallons/Day)	Days until empty	Date Tank is Empty	Lead Time	Reorder Date
3/20/2019	11,708	13,508	150	90	6/18/2019	30	5/19/2019

In column 4, you will need to estimate how much fuel is burned each day. You can estimate this a number of different ways, but the three easiest would be to: (1) use the value from day tank fuel meter to get the fuel consumed every day, (2) use the engine specifications for fuel burn rate per hour and multiplying by 24 or (3) divide the total gallons consumed in a year by 365. It is important that you check to make sure your

¹ [http://www.ak-
ea.org/Portals/0/Programs/Rural%20Energy%20Assistance/Bulk%20Fuel%20Upgrade%20Program/AEARu
ralBlkFuelFacOpHndbook2018.pdf?ver=2019-06-19-140029-493](http://www.ak-
ea.org/Portals/0/Programs/Rural%20Energy%20Assistance/Bulk%20Fuel%20Upgrade%20Program/AEARu
ralBlkFuelFacOpHndbook2018.pdf?ver=2019-06-19-140029-493)

estimate is correct. If you are actually consuming more fuel than you expected, you could run out of fuel unexpectedly.

Column 5 will require that you type an equation into the cell. In Excel, you will need to type in `=ROUND(B4/D4,0)`. This will give you the approximate number of days until the tank is empty.

Column 6 will require another equation. By typing `=A4+E4` into cell for column 6, you will be able to add the number of days until the tank is empty to the last date that fuel was delivered. This will give you the date you won't have any fuel left.

Column 7 is an estimate you will need to have for much time it will take from when you put in an order until you will receive the fuel.

Column 8 is another calculation. By typing in `=F4-G4` into the cell for column 8, you will get the latest that you should reorder fuel.

As in the case of the parts and supplies inventory, the utility should not carry more fuel than is needed for the period, because any fuel purchases made will need to be paid for by utility customers. If the fuel will not be used within a year that will be an expense that the utility will not be able to cover until it is consumed. This could put the utility in a bad financial position. It is not advised to try to stock up on fuel that is not needed—trying to guess the future price of oil is impossible and a number of utilities have had financial difficulties while trying to predict and save on the price of fuel.

Section B of the PCE UMR report lists the number of gallons of fuel consumed by the utility. Since this is such an important number for the utility, the manager should create a Fuel Usage spreadsheet which includes number of gallons of fuel used each month. The manager can look at the total consumed from the previous year and consider generation efficiency plus line loss to make predictions about fuel usage.

Fuel quality must also be checked on a regular basis. When water, dirt, and other contaminants get into the fuel, the utility's engines are in danger of catastrophic failure. Every year, AEA responds to emergencies caused by fuel fouled by water and other contaminants. To help protect the engines, **fuel tanks should be checked for water after every time that they are filled**. Sufficient time should be given for any water to settle out of the fuel and it should be checked with a plumb bob and water-finding paste. In addition to these inspections, the tanks should be checked every six months.

Since fuel costs are one of the largest components of a customer's rate, fuel efficiency (generally measured in kWh/gallon) is a primary metric to understand how the utility is doing. Decreases in efficiency are also a sign that the engine needs an overhaul. Without proper fuel management, it is difficult to know how accurate the efficiency figures are. **All utilities should have an accurate fuel meter going into the day tank to measure the gallons of fuel used by the powerhouse.** Without an accurate meter, it will be impossible to know if fuel is being lost somewhere in the fuel system. Losses can be the result of leaks or spills or from theft. Utility customers will have to pay for any lost fuel. Additional costs can be incurred from spills and leaks, so it is important to detect spills and leaks early to limit the utility's liability.

➤ Monthly Computation of Fuel Inventory Loss

The following table will help the manager locate any discrepancies with the fuel.

Item	Action	Gallons of Fuel
a) Beginning: Fuel in Tank	Measure	
b) Gallons of Fuel Purchased	Measure	
c) Gallons of Fuel Used	Measure	
d) Expected: Fuel in Tanks	[Calculation: (a) + (b) – (c)]	
e) Ending: Fuel in Tanks	Measure	
f) Gallons of Fuel Lost	[Subtract (e) from (d)]	

Always look at the number of gallons of fuel lost and be able to explain that loss. Calculating fuel lost is performed for a reason. Look for:

- Fuel spills or leaks
- Is the fuel meter operating correctly?
- Check around the tank farm for any problems with the fuel tanks

- Check your math on the Fuel Inventory Worksheet
- Consider employee fuel theft
- Consider community resident fuel theft

Remember: Fuel Inventory and Non-fuel Inventory ties up electric utility cash that could be used somewhere else.

Chapter 17: Routine Maintenance

Section Contents:

300-Hour Service

900-Hour Service

1,800-Hour Service

4,500-Hour Service

Repair & Replacement

10,000-15,000-Hour Service

30,000-Hour Service

60,000-Hour Service

Preventive maintenance is the key to lower operating costs.

Scheduled maintenance of the electric utility's engines is based upon the number of hours the engines have operated and, generally, is scheduled at intervals of 300 hours, 900 hours or 1,800 hours for the size of engines that are most likely to be found in most communities (<300 kW capacity). The maintenance and hours of each engine must be tracked.

What follows are common maintenance intervals and the types of expected maintenance. **Always know and follow the manufacturer's maintenance schedule.** Keep in mind that if the utility has multiple engine types, the maintenance schedules may be different for each engine. It is very important that the utility has the necessary parts and supplies on hand to perform routine maintenance. See Chapter 16: Inventory for suggestions.

Performing the routine maintenance as required by the manufacturer is the best way to ensure that the utility gets the best performance of its engines for the expected useful life. In the long run, skipping or extending the maintenance intervals will end up costing the utility more money through lower efficiency, power outages, unscheduled maintenance, and the more frequent engine replacements.

The following paragraphs briefly describe common maintenance items at typical service intervals. The Utility Manager should refer to the Operations and Maintenance Manual for

the power house, and manufacturer recommendations for each gen-set to define and modify specific work items for each maintenance interval.

➤ 300-Hour Engine Service

If the required maintenance cannot be performed at the scheduled time, the engine should be taken out of service until all work has been completed.

The most important maintenance that can be done on the engine is changing the [engine oil](#) and installing a new [oil filter](#). Expect that during a typical year, the utility will need to budget for enough engine oil and oil filters for about 35 oil changes.

In addition to the oil change, typically all *belts* and *hoses* need to be checked for wear and aging, replacing them as needed. Check the water pump for any fluid seeps. If there are seeps or leaks, the problem should be fixed during the 300-hour maintenance or submitted as a Work Order. The dust trap (rubber boot) on the bottom of the air filter should be cleaned. Some engines may be required to have *Grease Actuator Rod Ends*.

➤ 900-Hour Engine Service

If the required maintenance cannot be performed at the scheduled time, take the engine out of service until all work has been completed.

Every 900 hours several additional tasks are added to the regular 300-hour service. Several filters need to be checked and changed. These typically include the [fuel filters](#) and the [glycol filters](#) for both the cooling and heat recovery systems. The air filter should be checked, it may need to be changed.

➤ 1800-Hour Engine Service

In addition to the tasks for the 300-hour and 900-hour service, the following tasks are typically performed on each engine after every 1,800 hours of run time.

If the required maintenance cannot be performed at the scheduled time, take the engine out of service until all work has been completed.

If the air filter was not changed at the 900-hour service, the [air filter](#) should be changed. On most engines, the operator should adjust the [valve tappets](#). Inspect the wiring inside the generator enclosure.

➤ 4,500-Hour Engine Service

In addition to the 300- and 900-hour services, after 4,500 hours of engine runtime, the battery should be serviced/ replaced, and the radiator and after-cooler should be cleaned. No additional special supplies are needed for this servicing. The crankshaft damper should be checked.

The above should serve as a guideline for the most common maintenance schedules for engines. Always follow the manufacturers' suggested maintenance schedules for the engines in the powerhouse. The Engine/Generator Maintenance Log is available as a downloadable spreadsheet file that can be modified to meet the needs of the utility.

If your community has wind, hydro, or solar generation, please reference applicable Operations and Maintenance Manuals, and follow the manufacturers' scheduled maintenance recommendations. The Utility Manager is responsible to track the maintenance of each asset inside the powerhouse.



Engine/Generator Maintenance Log

ENGINE/GENERATOR MAINTENANCE LOG

COMMUNITY: _____

Engine #: _____

Engine 300 Hour Service	Lube Oil & Filter Change:		Grease Actuator Rod Ends:		Comments and Supplies used:
Planned total hours:	Clean Air Filter Dust Trap:		Check Water Pump (leaks):		
Actual total hours:	Check Belts & Hoses:				
Date:	Maintenance Performed by:				
Engine 300 Hour Service	Lube Oil & Filter Change:		Grease Actuator Rod Ends:		Comments and Supplies used:
Planned total hours:	Clean Air Filter Dust Trap:		Check Water Pump (leaks):		
Actual total hours:	Check Belts & Hoses:				
Date:	Maintenance Performed by:				
Engine 900 Hour Service	Lube Oil & Filter Change:		Grease Actuator Rod Ends:		Comments and Supplies used:
Planned total hours:	Clean Air Filter Dust Trap:		Check Water Pump (leaks):		
Actual total hours:	Check Belts & Hoses:		Check/change air filter:		
	Crankcase filter change:		Check Belts & Hoses:		
Date:	Maintenance Performed by:				
Engine 300 Hour Service	Lube Oil & Filter Change:		Grease Actuator Rod Ends:		Comments and Supplies used:
Planned total hours:	Clean Air Filter Dust Trap:		Check Water Pump (leaks):		
Actual total hours:	Check Belts & Hoses:				
Date:	Maintenance Performed by:				
Engine 300 Hour Service	Lube Oil & Filter Change:		Grease Actuator Rod Ends:		Comments and Supplies used:
Planned total hours:	Clean Air Filter Dust Trap:		Check Water Pump (leaks):		
Actual total hours:	Check Belts & Hoses:				
Date:	Maintenance Performed by:				
Engine 1800 Hour Service	Lube Oil & Filter Change:		Grease Actuator Rod Ends:		Comments and Supplies used:
Planned total hours:	Clean Air Filter Dust Trap:		Check Water Pump (leaks):		
Actual total hours:	Fuel filter change:		Glycol Filter change		
Date:	Crankcase filter change:		Check/change air filter		
	Inspect wiring inside Generator Enclosure (look for wear, make sure lugs are tight):		Adjust valve tappets		
	Check Belts & Hoses:		Maintenance performed by:		

➤ Repair and Replacement (R&R)

Even with proper maintenance, there will still be wear and tear on the engines and generators. Periodically, it will be necessary to perform non-routine maintenance, generally referred to as Repair and Replacement (R&R). The expected intervals between R&R activities are highly dependent upon the type of engine and the quality of routine maintenance

Most manufacturers suggest that the performance metrics be tracked to determine when an overhaul is needed. The [daily logs](#) can provide data that will allow the manager to track some of the factors. In particular, the engine's oil consumption and efficiency must be tracked. If the oil consumption increases or the efficiency decreases, these are signs that an overhaul is needed. If an engine is not able to produce its rated power, potentially indicated by frequency drops, this is also a sign that an overhaul might be needed.

The most common schedule for R&R is at 10,000-15,000 hours, 30,000 hours, and 60,000 hours. Unless the utility's operator is highly skilled, it is likely that the utility will need to budget for a contractor to come to the community to perform the R&R. Although each of these non-routine maintenance activities will be fairly expensive, they will increase the efficiency and life of the engine. The expenses associated with R&R can be amortized over multiple years (generally three years) so that customers do not have a spike in their rates.

Additionally, it is not uncommon to find other maintenance issues during major service intervals. When these issues are found, they will need to be addressed and will likely result in additional cost. To the extent possible, the Utility Manager should have contingency funds available to cover these types of unplanned expenses.

➤ 10,000-15,000-Hour Service

A top-end rebuild is done in the powerhouse by qualified personnel. It is likely that the utility will have to hire an outside contractor to complete the service. The top-end rebuild typically includes changing the valves and injectors, inspecting the charge air cooler, and potentially replacing the water pump, fuel pump, main bearings, rod bearings, thrust bearings, crankshaft seals, and turbo. Actual scope of service will be dependent on the specific engine, and the most recent manufacture recommendations.

➤ 30,000-Hour Service

A major rebuild (also known as an in-frame rebuild) will also be performed in the power house by qualified personnel. Tasks to be completed during the 30,000-Hour service typically include all the services performed at 10,000 hours, as well as replacement of the cylinder liners and pistons. The engine and generator-end bearings will also typically be checked and likely replaced. Actual scope of service will be dependent on the specific engine, and the most recent manufacturer recommendations.

➤ 60,000-Hour Service

For smaller engines (<300 kW), most engines will need to be replaced around 60,000 hours. Some engines may be able to have another major rebuild before needing to be replaced. Refer to the manufacturer for engine and generator specific recommendations

If the community has wind, hydro, or solar generation, refer to applicable Operations and Maintenance Manuals, and the manufacturer's scheduled maintenance.

Chapter 18: Work Orders

Section Contents:

Sample Work Order Policy

Example Work Order

Best Practices for Work Order Management

Which Orders Should You Complete First

The reason that electric plants have inspections performed by the operators is to make sure everything is running properly and to look for any potential problem in any of the systems. Inspections can help find easy-to-fix problems that could turn into major problems before a catastrophe strikes. But even with proper and timely inspections, the manager must expect that parts in the powerhouse will eventually break or need to be replaced. The manager must have a way to know about all of the current and potential maintenance issues so that they can be budgeted for and the work can be completed.

A work order is a request for services. It includes the scope of work that needs to get done and an estimate of the cost. Setting up an effective work order system is a way to provide the manager with the information needed to make decisions about which maintenance activities should be done when. A work order allows the operators and the manager to record all needed non-routine maintenance, even if it is not vital or time sensitive. The daily inspections and scheduled maintenance should be the primary source of work orders. A work order is a way of documenting work done that is not on the operation and maintenance routine task plan. The work order will produce an estimate of materials and labor for a specific job.

Either the operator, the manager, or both together can fill out the work order. A request should include enough information for the manager to determine how important the work is and how quickly the work needs to get done. The cost estimate should include both the time and materials required to finish the work correctly.

A work order should document every non-routine maintenance event. The utility should have a policy on who needs to approve different types of non-routine maintenance. The utility should have a policy that is clear and easy to follow. The policy's purpose should

be to make sure that money is spent properly and that the utility is run well, and can document actual costs associated with non-routine work orders. The operator, manager, and board should all have different levels of authority when it comes to spending money.

➤ Sample Work Order Policy

Work orders which the operator can do without approval: If the operator can do the work without overtime or buying parts or supplies, no additional approval should be needed. The operator should inform the manager what was or will be done to make sure there aren't more important needs. In special and extreme cases, such as when the manager and board is out of town, the operator should have the authority to take care of catastrophic events.

Work orders which require manager approval: If the work fits with the current budget, the manager should have the authority to approve any work that requires that the utility spend money to purchase materials and supplies, hire contractors, or overtime for employees.

Work orders which require board approval: Only the board should have the authority to approve work that is not in the budget, as it will require a budget amendment. In some extreme and catastrophic cases, it may be required that board approval be provided after the fact so that an emergency work order can be fixed during the emergency.

An example Work Order is provided on the following page. This will provide you with ideas for information you will want to include in your own Work Order forms.

Example Work Order Form

Date:	Work Requested by:	Work Order number:		
Description of work requested:				
Type of impact (Safety, Risk of catastrophic failure, Reliability, Efficiency, Revenue)				
Expected benefits:				
Size of potential impact (High, Med, Low)	Time Sensitivity (High, Med, Low)	Date Required:		
Cost Estimate of Required Work				
Materials Description	Quantity	Unit	Unit Cost	Total
1			\$	\$
2			\$	\$
3			\$	\$
4			\$	\$
5			\$	\$
			Total	\$
Labor/Equipment Estimate	Quantity	Unit	Unit Cost	Total
1		Hours	\$	\$
2		Hours	\$	\$
3		Hours	\$	\$
4		Hours	\$	\$
5		Hours	\$	\$
Total hours labor required for work			Total	\$
			Total Cost Estimate	\$
Work Order Approved by:				
Date work performed:	Work performed by:			
Description of work performed:				
Actual Cost of Work Performed				
Materials Description	Quantity	Unit	Unit Cost	Total
1			\$	\$
2			\$	\$
3			\$	\$
4			\$	\$
5			\$	\$
			Total	
Labor/Equipment	Quantity	Unit	Unit Cost	Total
1		Hours	\$	\$
2		Hours	\$	\$
3		Hours	\$	\$
4		Hours	\$	\$
5		Hours	\$	\$
Total hours labor used for work			Total	\$
			Total Actual Cost	\$

➤ Best Practices for Work Order Management

Complete the Paperwork, Even if it's After the Fact

In cases where there was an emergency and there perhaps wasn't enough time to follow the normal procedure, or people forget in the heat of the moment, the work order form should be completed after the fact. Having all of this information will help the manager explain to the utility's board what happened and how the utility responded. It will also help make sure that all eligible expenses are being reported to the Regulatory Commission of Alaska in the annual report.

Assign a Unique Tracking Number to Each Work Order

A number should be assigned to all work orders so that they can be tracked.

Keep It Simple

The person requesting the work should write a Description of work requested that a non-technical person will understand.

Back Up the Request with Background Information

Some reasons for why the request is being made should be included. In the example work order, this includes factors such as:

Type of impact

(Safety, Risk of catastrophic failure, Reliability, Efficiency, or Revenue/Income) that the work order is going to have on the utility

Expected benefits

How will this project save costs, now or in the future?

Size of potential impacts

How important is the work? If it is not done, will it have a major or minor impact on customers?

Time sensitivity

Does something need to get done now, or can it wait?

All of these may be used as the reasons presented to the utility board for why money needs to be spent on the work.

Estimate Costs of Materials and Labor

Each work order should break out the material costs from the estimated labor costs. Especially since these might be tracked differently in the accounting system and the budget, separating the materials from labor can help in budgeting. You might want to include if the work can be done by utility staff or if it needs to be done by contractors. The estimates can be done by utility staff or, if it is a bigger job, with the help of AEA's Circuit Rider program or private contractors.

Sample Project Cost Estimating Form

Date:	Parts Requested by:		Parts Order #:		
Description of Parts Requested:					
Time Sensitivity (High, Med, Low)			Date Required:		
Cost Estimate of Required Parts					
Materials Description (Part #, etc.)	Quantity	Unit Cost	Cost	Vendor (Phone #, Website)	Expected Re-Order Date
1			\$ -		
2			\$ -		
3			\$ -		
4			\$ -		
5			\$ -		
6			\$ -		
7			\$ -		

Once the estimate is complete, the manager can then check the budget and the inventory to see if it is possible to do the job. The manager either approves, denies, or postpones the work. If the work order is approved, the manager schedules a time for the work to be done.

If possible, the utility should get two or three estimates for how much the work will cost and how soon it can be completed. Before any money is spent or committed, it is important that the utility follows its procedures for spending utility funds. If there is not sufficient cash, and the work order is important enough, it may make sense to take on debt to perform the work.

Especially since grant funds are more difficult to come by now, it is important that the utility do what it can to maintain the utility's infrastructure.

After the job is completed, the actual materials and labor used are filled in on the work order. This is how the manager will know how much the job really cost. The manager should also check to see if paying for the work order will require a budget amendment and/or a change in customer rates in order to pay for the work.

Keeping track of work orders is a very good idea. Unfinished and finished work orders should be filed separately. Unfinished work orders should be looked over at least every month to see what the utility needs to plan for or if the work order is still needed. Finished work orders need to be filed with the expenses for the work order so that if the utility needs to do similar work again, there is an example of what needed to be done and how much it cost.

Expect to report to the utility's board of directors on the progress of the outstanding work orders, any budget changes, if the utility needs to take out a loan, or if rates will have to change to pay for the work. Note that without an accurate record of work orders and their associated costs, a utility manager is often dependent on the memory of those involved when called upon to account for expenses related to non-routine repairs and emergency work.

➤ Which Work Orders Should You Complete First?

It is likely that there will be more maintenance items than what the utility has the time or money to fix. If this is the case, the utility manager will need to prioritize what is most important to fix. There are three factors that can be used to prioritize work orders:

1. The type of issue,
2. The seriousness of the issue, and
3. How quickly the issue must be resolved.

Type of Issue

All issues should fall into one or more of the following **types of issue**:

Safety includes all potential harm to workers and the public. If an issue could cause injuries to workers or the public, this should be the highest priority.

Risk of catastrophic failure includes issues that could lead to long-term outages and/or destruction of property. These can be either caused by the natural environment (such as floods, thawing permafrost, eroding banks) or people related (such as vandalism.)

Reliability includes less catastrophic, but still serious issues that can cause service disruptions. These can include distribution system issues such as trees overhanging the electrical lines or generation issues due to inadequate maintenance.

Efficiency includes issues that increases customer costs from inefficient operations. These can include issues in the distribution system that increase line loss (oversized or inefficient transformers) or poor servicing of the engine that has decreased engine efficiency.

Lost Income includes issues that decrease the ability of the utility to capture revenue. These can include an inoperable heat recovery system or broken meters.

Seriousness

After categorizing the type of impact, the **seriousness of the issue** should be estimated as high, medium, or low.

High is anything that could cause a major problem for the utility or community. These include major safety issues that could result in the potential loss of life or severe injury, significant fuel spills, severe damage to property, and/or major loss of income. Other high magnitude issues could be the powerhouse or other infrastructure near an eroding bank or threatened by active permafrost thawing.

Medium is less severe than High, but the consequences for letting it go on could increase or could become a danger to the power plant and/or the community.

Low includes issues that may have low consequences, but that the utility still would need to fix when time and money permit.

Necessary Response Time

The manager should also estimate **how quickly the issue must be resolved**. Some issues may need to be fixed immediately (an engine has failed unexpectedly) whereas some may be years away (the river is moving slowly towards the powerhouse).

The utility manager and board of directors should make decisions on how to prioritize work orders that need approval and/or additional funding. For projects that are not needed immediately or exceed available funds, the utility manager should consider following the examples of utility improvement projects in Chapter 12.



Chapter 19: Utility Performance Indicators

Section Contents:

Operational Metrics

Diesel Efficiency

Line Loss

Stable and Reliable

Station Service

Heat Recovery

Renewable Energy Efficiency

Phase Imbalance

This chapter will introduce a number of metrics, also called key performance indicators, that can be used to easily track and evaluate the operational performance and efficiency of the utility.

One way that the manager could keep track of the metrics is by keeping a spreadsheet workbook with a tab for each of the metrics that the utility is tracking. This way, the manager will have all of the metrics in one place and it should be easy to update and track over time.

Key Performance Indicators can be used to:

- Improve service to customers
- Extend the lives of plant and equipment
- Reduce costs
- Discover potential problems
- Give performance goals to employees
- Provide information to employees, customers and the utility board

➤ Operational Metrics

With daily and monthly inspections, the utility will create a lot of information that can be analyzed. Sorting through all of the data to see what is important can be overwhelming. A metric is a simple way to measure outputs and inputs to evaluate the success of the utility. The data for these metrics will come from the readings logged on the daily and monthly inspection sheets. By creating the same metrics on a month to month and year to year basis, the utility can see if things are improving, staying the same or worsening over time.

➤ Diesel Efficiency

High generation efficiency keeps fuel expenses low which result in lower customer electricity rates. The more kWh generated with less diesel consumed, the greater the diesel efficiency. For many utilities, the efficiency of diesel generation is a key determiner of the cost of electricity in a community. Reducing the number of gallons consumed to produce required electricity in the community will likely reduce customer costs. Low efficiency can be a key indication that the engine needs to be overhauled. In either case, efficiency is a key performance metric for a utility to track.

$$\text{Efficiency (kWh per gallon)} = \frac{\text{kWh of diesel generation}}{\text{gallons of diesel consumed}}$$

KWh of diesel generation and gallons of diesel consumed can be found on the PCE Utility Monthly Report in Section B, No. 1 and 3. In the kWh of diesel generated. Make sure you only report on Diesel. Do not include Hydro, Wind, Natural Gas or Purchased. These monthly numbers are then transferred to Page 5 of your Annual Report Form, see Chapter 24: Annual PCE Report. Use these yearly numbers to calculate your diesel efficiency.

Additionally, the RCA has established minimum generation efficiency standards for participation in the PCE program. The standards require that a utility's fuel expense be calculated as if the generation system produced at least the minimum number of kWh for each gallon of fuel. As the table indicates, there are different standards depending on the percentage of diesel generation in the system. To see where your utility fits in the following tables, go to Page 5 of your annual report and calculate what percentage diesel

fuel consumed is of total fuel consumed. Select greater (>) or less than (<) 80% diesel and then select which column your utility is in for kWh generated.

Efficiency Standards (kWh/gallon)

	<100,000	100,000 to 499,999	500,000 to 999,999	1,000,000 to 9,999,999	>10,000,000
PCE minimum for >80% diesel	9.5	10.5	11.5	12.5	13.5
PCE minimum for <80% diesel	8.5	10	11	12	13
Achievable efficiencies	12	12.5	13.5	14.5	15

Using figures from the chart above,

$$\frac{854,760 \text{ (Diesel kWh generated)}}{1,301,757 \text{ (Total kWh generated)}} = 0.6566 = 66\%$$

This is less than 80%, therefore use the chart for PCE minimum < 80%.

$$\frac{854,760 \text{ (Diesel kWh generated)}}{69,430 \text{ (gallons consumed)}} = 12.31$$

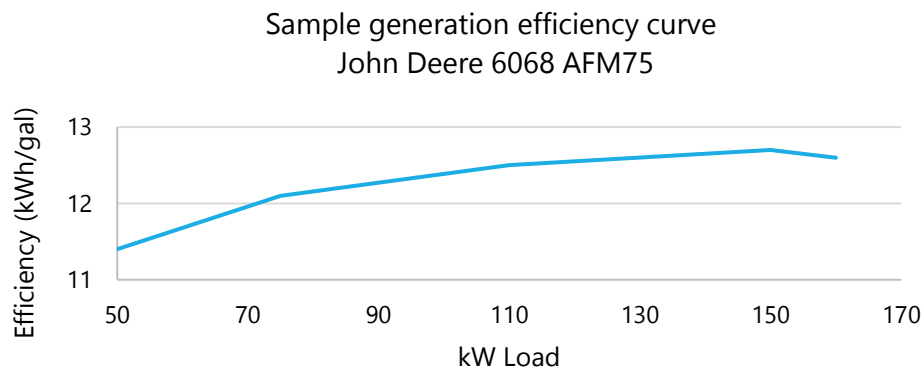
Since total kWh generated is > 1,000,000, the efficiency standard for this example is 12 kWh/gallon.

The last row of the efficiency standard table above also includes generic achievable kWh/gallon efficiency. Based on the utilities reporting to the PCE program, AEA has found that the minimum standards for the PCE program are below what is actually achievable. Utilities should aim for providing power at the lowest cost possible, and a key step is to improve the generation efficiency.

To fully understand the efficiency of the utility's infrastructure, the utility needs to know the expected generation of the engines actually installed in the powerhouse. It is quite possible that two utilities may have the same generation efficiency, but one may be operating towards the top of the potential efficiency of its engines and the other operating towards the lower end of its efficiency.

All engines will have a generation efficiency curve that is developed by the manufacturer (see the following example). It is expected that the efficiency of the engine will change based on the load; most engines get more efficient as they near their rated capacity. By comparing the actual efficiency of the engine to the expected efficiency from the manufacturer, the manager should be able to tell if the engine is operating properly and if a major overhaul or replacement might be needed.

Example Engine Efficiency Curve



➤ Line Loss

Line loss is defined by the RCA as the unaccounted kWh as a percentage of the Total kWh available for Sale. On an annual basis, if the Line Loss value is greater than 12%, the

Regulatory Commission of Alaska will reduce the utility's PCE rate. Even though the maximum allowable loss by the RCA is 12%, line loss should be less than 6%.

Line loss is defined as all kilowatt-hours generated or purchased, from whatever source, minus kilowatt-hours sold minus station service, divided by all kilowatt-hours generated or purchased.

$$\text{Line loss} = \frac{kWh \text{ generated} - kWh \text{ sold} - \text{station service}}{kWh \text{ generated}}$$

For instance, if the utility generated 100,000 kWh, sold 85,000 kWh, and station service is 6340 kWh, the line loss can be calculated as:

$$\text{Line loss} = \frac{100,000 \text{ kWh gen.} - 85,000 \text{ kWh sold} - 6,340 \text{ kWh service}}{100,000 \text{ kWh generated}} = \frac{8,660}{100,000} = 8.6 \%$$

Based on this equation, it is impossible to know the cause of the loss, as it could be a physical loss of power, a metering issue, or a recording issue. In any case, the line loss figure represents a financial issue for the utility, either as a loss of income or unnecessary fuel expense.

If the calculated line loss is above 6%, the manager should determine the source(s) of the losses. Each kWh that is generated but not sold represents either fuel that was consumed needlessly or a kWh that should be creating income.

In either case, utility customers are paying more for power than is needed.

Furthermore, high line losses, if they are caused by physical losses in the system, can represent a potential safety issue for the utility.

Decreasing Line Loss

Line loss above 6% can indicate excess loss in the distribution system, defective meters, improper reading of meters or unsafe conditions. Much of the time, line loss is because of errors in billing or reading meters. High line loss may indicate that the utility is wasting electricity, thereby wasting diesel which results in losing money.

The USDA Rural Utility System has guidance on how to evaluate two ways of potentially decreasing physical line losses:

Line loss above 6% can indicate excess loss in the distribution system, defective meters, improper reading of meters or unsafe conditions.

Increasing the System Voltage

Increasing the system voltage can be beneficial to the utility by reducing line loss. The costs, however, can be high. The USDA Bulletin 1724D-105 “Rural Distribution System Voltage Conversion Considerations” provides practical and financial advice on how to decide if it is worth increasing the utility’s distribution voltage.

Replacing the Distribution Transformers

Transformers are another common source of physical line loss, but it might not always make financial sense to replace transformers. The USDA’s Bulletin 1724D-107 “Guide for Economic Evaluation of Distribution Transformers”¹ and the accompanying electronic spreadsheet², can assist a utility in assessing the potential benefits of replacing transformers.

➤ Stable and Reliable Power

The utility manager should keep a log of all planned and unplanned outages and reliability incidences throughout the year. The following Outage Log template is an example of how a simple outage log can be arranged.

Outage log template (based on 3 AAC 52.495)

Incident #	Type of Issue (Outage,	Beginning date & time	Ending date & time	Total hours of incident	Number of	Cause of outage/ incident	Cost of incident
------------	------------------------	-----------------------	--------------------	-------------------------	-----------	---------------------------	------------------

¹ https://www.rd.usda.gov/files/UEP_Bulletin_1724D-107.pdf

² https://www.rd.usda.gov/files/UEP_Bulletin_1724D-107_Transformer_Loss_Formula.xls

	High/low frequency)				customers affected		
--	---------------------	--	--	--	--------------------	--	--

Based on the outage log, the manager should report the number of outages and total outage hours per reporting period. The manager should be able to explain why there is an increase or decrease in incidents and what is being done to increase the reliability of the system.

Per state regulations (3 AAC 52.490¹), utilities are required to provide the Regulatory Commission of Alaska with information regarding service outages. Depending on the severity of the outage, utilities have up to 5 days to report outages. Utilities are also required to provide the RCA with a yearly summary of outages.

For utilities interested in more information about tracking service interruptions, the USDA Rural Utility System has further explanations in Bulletin 1730A-119, "Interruption Reporting and Service Continuity Objectives for Electric Distribution Systems" (https://www.rd.usda.gov/files/UEP_Bulletin_1730A-119.pdf).

➤ Station Service

Unlike line loss or generation efficiency, there is no specific standard for station service. Because each powerhouse is different in configuration and output, there cannot be a one-size-fits-all approach. That does not mean that it is unimportant for the manager to track.

Each kWh that is consumed by the powerhouse is a kWh that must be produced but cannot be sold.

This means that utility customers must pay for diesel to produce the kWh used to run the powerhouse. The manager should track the station service kWh each reporting period. Especially if there are increases in station service, the cause should be investigated.

¹ <http://www.legis.state.ak.us/basis/folioiproxy.asp?url=http://www.jnu01.legis.state.ak.us/cgi-bin/folioisa.dll/aac/query=%5bJUMP:%273+aac+52!2E490%27%5d/doc/%7b@1%7d?firsthit>

Reducing Station Service Power

Increased station service could be a sign that fans, motors, or filters need to be replaced. The manager should aim for reducing unnecessary power consumption in the powerhouse by:

- Installing energy efficient lights, fans, and motors
- Making sure that things are operating appropriately
- Training staff to operate the powerhouse efficiently such as turning off lights and small appliances when not needed.

➤ Heat Recovery

If the utility has a heat recovery system installed, the manager should monitor that it is performing properly. By using the heat recovery meter reading on the Daily Inspection Log (see Chapter 15: Inspections), the manager can make sure that the system is working as expected. Ideally, the utility would have an engineer's estimate of the amount of heat that should be delivered for every month of the year; the reading from the heat recovery meter can be compared to this estimate.

If there is not an engineer's estimate, the manager can do a quick estimate based on the number of gallons of fuel consumed during the reporting period.

Converting between BTUs and Diesel

Every gallon of diesel has 138,000 BTUs

138,000 BTUs = 1 gallon of diesel

Convert the BTUs from the heat recovery meter to an equivalent gallons of diesel by dividing the reading by 138,000. (There are approximately 138,000 Btu per gallon of diesel.)

For example: If the Btu reading is 280,000, divide it by 138,000:

$280,000/138,000 = 2.02$ gallons of diesel

Over the months and years, the total amount of BTUs delivered to customers should be compared against the engineers estimate. If there is a large difference, the manager should investigate what might be wrong.

➤ Renewable Energy Efficiency

Even though renewable energy projects do not consume diesel, it is important that they are operating as expected. At a minimum, two metrics should be tracked to be able to communicate and analyze the performance of the renewable energy system.

The most straightforward assessment is the Performance Against Goal (PAG). This calculation is based on comparing the kWh generated by the Renewable Energy system to the kWh expected in the same period. Since wind, solar, and hydro resources are not always consistent or foreseeable, there can be difficulties in estimating the expected values over a short period of time. Even a monthly estimate can be unreliable, so the yearly performance goal should be used.

$$\text{Performance against Goal (PAG)} = \frac{\text{Actual kWh generated}}{\text{Expected kWh generated}} * 100\%$$

The PAG should be close to 100%. If it is much less than 80%, then the manager should investigate.

There are two further metrics that can be used:

Resource: The cause of a low PAG may be that the resource is less than expected. Due to factors outside of the utility's control, the wind may not have been as strong as expected, or rainfall might have been less over the year. To rule out resource availability, the resources should be tracked—at a minimum, the average wind speed for wind projects and inches of rain for hydro projects.

Availability: The wind turbine or hydro plant might have been out of service. The daily inspection logs will include data that will allow the manager to know if there is an availability issue. The SCADA system should also be set up to trend this data. Availability will be set as a percentage: 100% means that the generator is always available to produce power even if the resource is not cooperating, say the wind is not blowing.

Phase Imbalance

The utility has an obligation to provide customers with power that will not damage their appliances and devices. For customers that receive 3-phase power, the phase imbalance must be low or it can cause overheating. At a phase imbalance of great than 4%, it can shorten the lives of attached motors. Additionally, phase imbalance can cause similar issues for the utility's generators, causing overheating and early failure.

By using the Voltage Line 1-3 recording on the Daily Inspection Log, the manager can track the phase imbalance.

To **determine the phase imbalance**, the first thing is to calculate the average voltage of each phase.

For example, if the voltage on line A-B is **460**,
the voltage on line B-C is **430**,
and the voltage on line A-C is **480**,
the average is **456**.

(1) Find the average between each line

$$AB = 460$$

$$BC = 430$$

$$AC = 480$$

Find the average: $460 + 430 + 480 = 1370 / 3 = 456$ Average Voltage

(2) Find the difference between each line voltage and the average. This is the unbalance for each phase.

$$AB \ 460 - 456 = 4 \text{ V}$$

$$BC \ 430 - 456 = 26 \text{ V}$$

$$AC \ 480 - 456 = 24 \text{ V}$$

(3) Take the largest unbalance and divide it by the average and multiply by 100 to turn it into a %.

$$26/456 = .0570$$

$$.0570 * 100 = 5.7\%$$

In this example, the voltage unbalance exceeds more than 2%. In a three-phase system this can cause unbalance among the windings, which can be bad for the motor.

Part III: Reporting and Compliance

Chapter 20: Navigating the RCA Website

Section Contents:

Summary Tab

Matters Tab

Documents Tab

Pending Actions Tab

Calendar Tab

The [Regulatory Commission of Alaska](http://www.rca.alaska.gov) (RCA) has a website where a utility can look up their past annual reports, check the status of their utility and see other information that the commission has on file regarding the utility. The website address is as follows:

www.rca.alaska.gov

This chapter provides tips for navigating the RCA website and highlights some of the most helpful information you can access there.

Enter the [name of your utility](#) and click [GO](#):



In the example below, we entered in the name of the utility in Kongiganak, Puvurnaq Power Company.

▶ All Open Tariff Matters
 ▶ All Open Pipeline Dockets
 ▶ All Open Rule-making Dockets
 ▶ Find a Certificate
 Certificate Number? Go
 ▶ **Find an Entity (Company)**
 Puvurnaq Go
 ▶ Find a Matter
 Matter Number? Go
*Examples: U-06-002
TA758-2*
 ▶ Find an Order
 Order Number? Go
Examples: R-08-001(1)
 ▶ Find a Filing
 Tracking Number? Go
Examples: TR0806826

➤ Summary Tab

The Summary Tab provides contact information for the utility and the status of their certificate.

Home » Page Not Found » PPC
Puvurnaq Power Company

Summary Matters Documents Pending Actions Calendar

Home » Page Not Found » PPC
Puvurnaq Power Company

Summary Matters Documents Pending Actions Calendar

SUMMARY

Short Name PPC
 Address PO BOX 5009
KONGIGANAK, AK 99559
 Website
 Phone 1-907-557-5616
 Email

CERTIFICATES

To sort by a column, click the column heading

Certificate Number	Utility Type	Certificate Name	Certificate Status
395	Electric	Puvurnaq Power Company	Active

➤ Matters Tab

The Matters Tab lists utility issues that have been handled between RCA and the utility along with their status date.

MATTERS

Select the Matter type(s) to display

All Matters
 Dockets
 Tariff Matters
 Selected Matter Types
 Certificate-related Matters

To sort by a column, click the column heading Total Results: 1

Matter Number	Matter Subtype	Matter Description	Utility Type	Date Opened	Date Closed
U-87-071	Application - New Certificate	PPC (APLN F/ CPC&N TO OPERATE AS AN ELECTRIC UTILI More Details		9/8/1987	11/12/2002

➤ Documents Tab

The Documents Tab will give a utility access to correspondence, letters, memorandums and annual PCE Reports filed in the past. This is a historical list between the utility and the RCA.

To see your Annual Reports click on the line labeled 20XX PCE Annual Report.

<input type="checkbox"/>	TR1903857 View File(s)	6/17/2019	Staff Memorandum	Staff Memorandum for FY20 PCE Base Rate Change to All Participating PCE Entities	
<input type="checkbox"/>	TR1902020 View File(s)	4/12/2019	PCE (Non-Regulated)	2018 PCE Annual Report (CPCN 395) for Puvurnaq Power Company Filed By: Roderick Phillip More Details	
	View File(s)			More Details	
<input type="checkbox"/>	TR1806821 View File(s)	12/20/2018	Staff Memorandum	Staff Memorandum for Puvurnaq Power Company Filed By: Brenda K. Cox More Details	
<input type="checkbox"/>	L1800496 View File(s)	12/20/2018	Letter Order	L1800496: Letter Order for PC07-0417B, Puvurnaq Power Company - Fuel Report and Purchased Power Update More Details	2018 Letter Orders
<input type="checkbox"/>	TR1806506 View File(s)	11/19/2018	PCE (Non-Regulated)	2018 PCE Fuel Report (11/01/17 - 10/31/18) CPCN 395 for Puvurnaq Power Company Filed By: Roderick Phillip More Details	
<input type="checkbox"/>	L1800241 View File(s)	6/27/2018	Letter Order	L1800241: Letter Order with FY 2019 PCE Base Rate Change More Details	2018 Letter Orders
<input type="checkbox"/>	TR1803794 View File(s)	6/25/2018	Staff Memorandum	FY19 PCE Base Rate Change Memo Effective July 1, 2018 for Puvurnaq More Details	
<input type="checkbox"/>	TR1802154 View File(s)	4/23/2018	PCE (Non-Regulated)	2017 PCE Annual Report CPCN 395 for Puvurnaq Power Company Filed By: Roderick Phillip More Details	
	View File(s)			More Details	
<input type="checkbox"/>	L1700500 View File(s)	12/26/2017	Letter Order	L1700500: Letter Order to PC07-0417, Puvurnaq Power Company - Annual Report and Fuel Report More Details	2017 Letter Orders

➤ Pending Actions Tab

The Pending Actions tab will let the utility know if the RCA is waiting for anything from them or if they are considering a decision regarding the utility.



➤ Calendar Tab

The last tab gives you a calendar.

Chapter 21: Fuel Reports

Section Contents:

State of Alaska Motor Fuel Tax Exemption

RCA Fuel Report Form

➤ **State of Alaska Motor Fuel Tax Exemption**

Diesel fuel purchased for the power plant is not subject to the State of Alaska Motor Fuel Tax. Always check your fuel invoices from your vendors and make sure they did not charge you this tax. If you were not aware of this and you were charged this tax and you paid this tax, there is a form to request a refund of this tax from the State of Alaska. This is Form No. 544 Claim for Refund. The form is available online.

Alaska Motor Fuel Tax Waiver Form

Also available online is Form 04-538. This is available from the Department of Revenue. At the beginning of each year, you can fill out one of these forms for each fuel vendor and you will not be charged the fuel tax.

➤ **RCA Fuel Report Form**

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 purchased fuel within a year. Some utilities get fuel weekly and must report monthly while others get one barge delivery annually and report only once per year. Every time RCA reviews a fuel report, your utility will be charged a \$39.00 fee. Forms are located on the RCA website.

The following information is required for the RCA Fuel Report Form:

1. Enter Fuel Storage Capacity in Gallons

Ask your fuel farm operator which tanks belong to the electric utility. Add up the capacity in each tank and then total the tanks.

2. Beginning Fuel Inventory

How much fuel was on hand **prior** to the first delivery of the reporting period? Your fuel farm operator will have to read the meter on the tanks or dip the tanks and equate the inches to gallons of fuel before you receive your first delivery of fuel.

3. Last Approved Fuel Cost per Gallon

This is the last weighted fuel price approved by the RCA. You will find this number on the most recent Letter Order from the RCA following the last evaluation of a fuel report. If you cannot find it in your utility, go to the RCA website. See Chapter 19: Navigating the RCA Website for instructions.

4. Multiply Beginning Fuel Inventory (#2 above) x Last Approved Fuel Cost per Gallon (#3 above)

5. Reporting Period Purchases

Gather all of your fuel delivery invoices for this reporting period and enter in the Invoice number, delivery date, number of gallons received, cost per gallon, and any delivery/mark-up for gallon. The spreadsheet will calculate Total Cost, Total Gallons, and New Weighted Average for you.

6. Fax your Fuel Report to the RCA at (907) 276-0160. Include copies of all invoices listed on the report.

7. Purchased power

If your utility purchases power from another utility or independent power producer, you can use the form to report the costs associated with those purchased kWhs. You will need to mark "Yes" in the appropriate box and include the number of kWhs purchased and the total cost of purchased power.

8. Rates

If the cost of fuel or purchased power has changed since the last reporting period, it is important that utility **update customer rates**. See Chapter 11: Setting Rates for more information.

Non-Regulated PCE Fuel and Purchased Power Cost Report Form

Utility Name: _____

Reporting Period beginning _____ through _____

Enter Fuel Storage Capacity in Gallons here ----> _____ - _____

	Invoice Number	Delivery Date	Gallons	Cost per Gallon	Delivery/Mark-Up per Gallon	Total Cost
Beginning Fuel Inventory			-			
Last Approved Fuel Cost/Gal.				\$ -		
Beginning Fuel Inventory in Gallons X Last Approved Fuel Cost/Gal. = Beginning Fuel Inventory Cost -->						\$ -
Reporting Period Purchases						-
						-
						-
						-
						-
						-
						-
						-
						-
						-
						-
						-
						-
						-
Totals for Reporting Period Purchases on this sheet:			-			-
Totals from Continuation Sheet			-			-
Grand Totals (beginning inventory plus purchases) A			-			-
						B \$ -

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

Did the utility purchase any power during this period? YES NO
 Total kWh purchased: _____ Total cost of purchased power: \$ _____

Have Customer Rates Changed? YES NO
 (If yes, attach a copy or summary of the effective rate schedule for each customer class)
 Date: _____ Signed: _____
 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.**

Chapter 22: Reporting to the Utility Board

Section Contents:

Cover Page

Overview of Month

Finance

Operations: Safety & Outages

Questions

The utility's Board of Directors, which may be the city or tribal council, a co-op board, or some other governing body, should expect that the utility's manager will give an update every month. The utility board is the manager's boss and should make sure that the utility's business is being handled properly.

The utility board should ensure that the utility is:

- Providing customers safe, stable, reliable, and affordable energy
- Able to pay for itself
- Abide by all requirements of utility's CPCN

To accomplish these goals, the utility board should approve policies that the utility will follow. Types of policies should include:

- Collections
- Grievances
- Budget
- Personnel
- Rate-setting
- Long-term planning
- Risk management
- Travel

The utility board is ultimately responsible for planning for the utility's future. The board should work with utility staff and contractors to make sure that utility has the infrastructure, staff, and capabilities to be successful now and in the future.

The last role that the utility board is to monitor the financial and operational performance of the utility. Particularly with non-profit and publicly-owned utilities, the utility board must balance needs of the customers with the needs of the utility. In order to make sure that the utility is balancing these needs and being fair to all customers, the board must

require periodic reporting that will allow it to meet the board's mandate. What follows are examples of the type of information that the board should be interested in receiving.

The monthly report does not have to be done as a presentation; it depends on what the community and the board members are comfortable with. What is important is that the same or similar information is provided on a monthly basis so that the board can track if the utility is improving or getting worse. The monthly reports should be made available for utility customers as well.

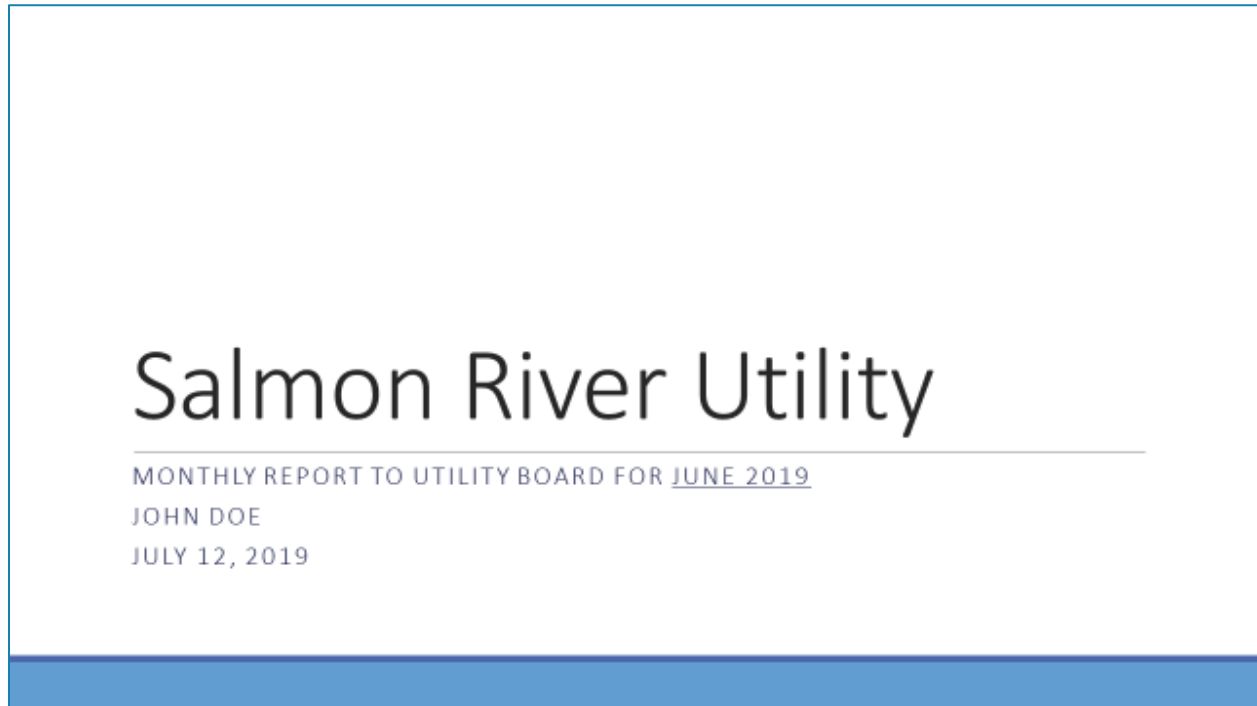
Remember, before creating any end of month reports:

- Complete and enter any deposits for the reporting period
- Enter any vendor bills for the reporting period
- Reconcile all bank accounts
- Reconcile all cash accounts



➤ Cover Page

The cover page shows the monthly reporting period and who is reporting.



➤ Overview of Month

A summary or overview of the month should follow the cover page. The following example divides the overview into Finances and Operations. The manager and the board should come together to determine what things should be reported on each month. It is very important that the board is able to understand the update and that the board gets all the information needed to make sure that the utility is being operated adequately.

The overview for each of these categories should be easy to explain—things are getting better or worse, sales were higher or lower than expected.

Each utility may want different things to be reported. You can also check out Chapter 10: Financial Indicators and Chapter 19: Operational Performance Indicators for other ideas.

Overview of [month]

<u>FINANCES</u>	<u>OPERATIONS</u>
KWh sales [<i>less/more</i>] than expected	Safety incidents
Income [<i>less/more</i>] than expected	Outages
Collections are [<i>stable/worse/improving</i>]	Generation efficiency has been [<i>steady/improving/decreasing</i>]
Actual expenses [<i>less/more</i>] than expected	Routine maintenance [<i>was/was not</i>] completed
Line loss [<i>steady/improving/worse</i>]	Utility inventory for parts and supplies is [<i>good/low</i>]
 	Utility fuel inventory is [<i>good/low</i>]
Overall, finances are [<i>worse/better</i>] than expected	Overall, operations are [<i>worse/better</i>] than expected

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➤ Finance

Sales, Income and Collections

A board should be interested in the utility's sales, income, and collections. The manager should be able to explain how and if the kilowatt-hours sold to customers has changed since the previous month. If there has been a big change, or an ongoing trend, it would be important to know why. Are residential customers consuming less energy? Did the utility lose a large customer?

The income should be reported in a similar manner. In most cases, the income should be reported to the board as how many customers were billed during the month. The manager should also report the amount that was collected from customers.

Finance

Sales, Income, and Collections

SALES

Month	Sales (kWh)
Feb 2019	
Jan 2019	
Feb 2018	

Sales have been generally
[increasing/decreasing]

INCOME

Month	Income (\$)
Feb 2019	
Jan 2019	
Feb 2018	

Income has been generally
[increasing/decreasing]

COLLECTIONS

\$XXX was collected

% of customers paid bills

% of bills (by \$) were paid

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Expenses

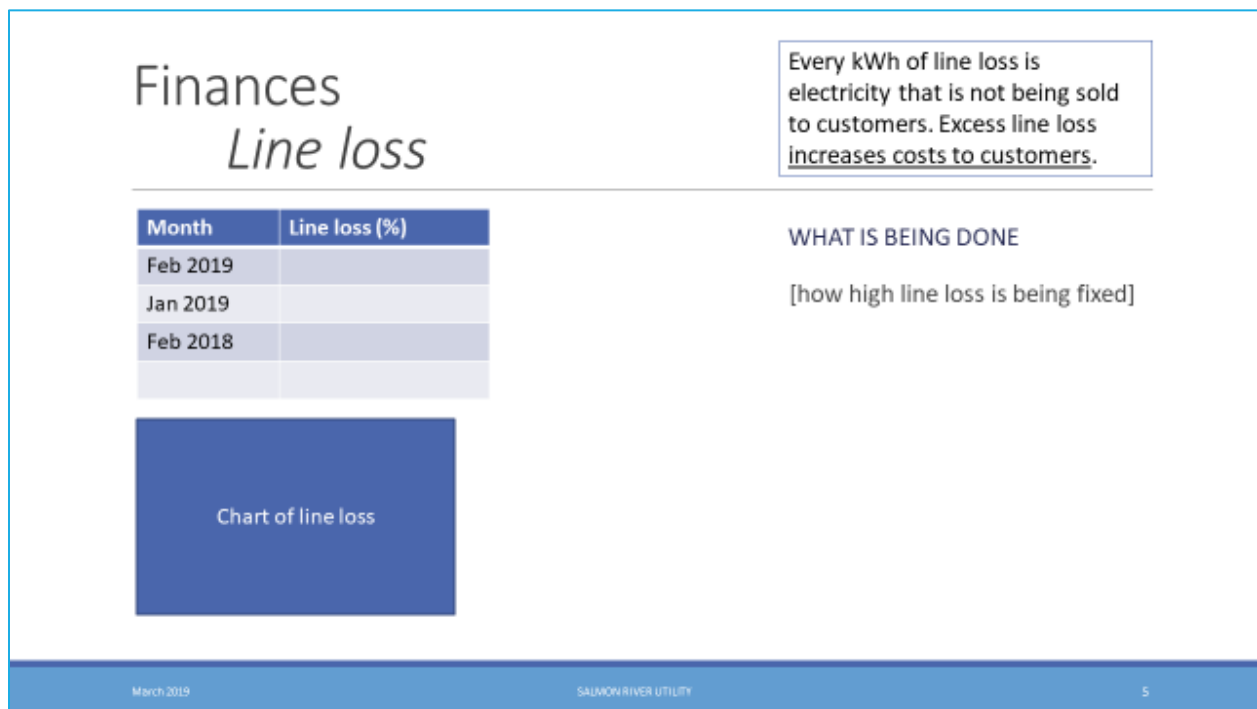
For each month, the manager should compare the budget-to-actual spreadsheet for the month and the year-to-date (see Chapter 3: Creating a Budget for more information on this topic). The manager should be able to explain any differences between the budget and the actual expenses. If an amendment is needed, the manager should request a budget amendment. If the budget amendment is large enough, the manager should be able to explain how the budget amendment could change customers' rates.

Finances	
<i>Expenses</i>	
<u>BUDGET TO ACTUAL</u>	<u>BUDGET AMENDMENTS NEEDED</u>

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Line Loss

Line loss is a figure reported for Power Cost Equalization. It is a measure of the difference between the amount of power generated and sold to customers. Although line loss can be caused by either physical loss of power in the distribution system or metering issues, in many cases, line loss is a good way to determine if the utility has metering or meter reading issues. **In most rural communities, line loss should be around 5%.** The manager should investigate if line loss is high and track down what the issues are. The first step will always be to check the customer ledger for irregular entries.



PCE Effective Rate

Most PCE-eligible utilities are very concerned about making sure that the utility's customers receive all of the PCE reimbursement that they are owed. The rate that customers pay after the PCE reimbursement, called the **PCE effective rate**, is a great indicator of how well the utility is maximizing the reimbursement for customers.

If the PCE effective rate is much above \$0.25/kWh, the utility manager needs to make sure that:

- all utility expenses are being reported to the Regulatory Commission of Alaska,
- the residential rate is based on the actual costs of the utility, and that
- the line loss and generation efficiency are within the program's guidelines.

The utility manager should report on the effort to bring down the utility customers' effective rate.

Finances PCE

Month	PCE effective rate	WHAT IS BEING DONE
Feb 2019		[how is PCE effective rate is being reduced or maintained]
Jan 2019		
Feb 2018		

PCE effective rate is the rate residential customers pay on first 500 kWh.

In the best managed utilities, the PCE effective rate is <\$0.25/kWh

Our utility's effective rate is **[higher than it should be/on target]**

March 2019
SALMON RIVER UTILITY
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➤ Operations

Safety and Outages

After reporting on the utility's finances, the manager should report on the utility's operations. Like the utility's finances, the manager and board should decide on which operational parameters the manager should report on a regular basis. The manager should keep track of any safety issues and outages that take place in the month. It is important that issues are fixed.

Operations

Safety and Outages

<p><u>SAFETY PROBLEMS</u></p> <p># and types of problems</p> <p>What is being done to make utility more safe:</p>	<p><u>OUTAGES</u></p> <p># of outages, causes, customers affected</p> <p>What is being done to improve reliability:</p>
--	--

March 2019
SALMON RIVER UTILITY
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Generation Efficiency

Most PCE-eligible communities generate most of their electricity from diesel-powered generators. The efficiency of that generation, generally measured in kWh produced per gallon of diesel, is very important to the customers' cost of power.

If the efficiency gets worse, it may also be a sign that the engine needs to be overhauled.

It can be useful to compare the current efficiency with the previous month and previous year. If you know how to make a chart, showing many months and years can be easily done. Always include what the utility is doing to improve or maintain the generation efficiency.

Operations *Generation Efficiency*

Month	Diesel consumed (gallons)	kWh generated	Efficiency (kWh/gallon)	
Feb 2019				WHAT IS BEING DONE [how generation efficiency is being improved/maintained]
Jan 2019				
Feb 2018				

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Maintenance

As seen in previous chapters, maintenance will need to be done every month. Routine maintenance, such as oil and filter changes, will likely be done every 10-14 days. Even without any unexpected failures, major maintenance could be done yearly or even more frequently.

Since regular maintenance is the best way to keep utility infrastructure in good working order, the utility board should expect to be updated on continued maintenance. The manager should know if there will be any planned maintenance in the coming month.

Operations <i>Maintenance</i>	
<u>ROUTINE MAINTENANCE</u>	<u>MAJOR MAINTENANCE</u>
Routine maintenance performed last month:	Last major maintenance completed:
Routine maintenance expected in next month:	Next expected major maintenance:
	<ul style="list-style-type: none">• What• When• How much \$

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Inventory

In order for the utility to operate and perform the needed maintenance, the operator must have access to fuel, supplies, and materials. On a monthly basis, the manager should take stock of how much inventory the utility has. In particular, the utility should keep track of the amount of fuel on hand just to make sure that there isn't a fuel emergency in the community. The utility board needs to be informed if the budget needs to be amended to buy more parts and supplies.

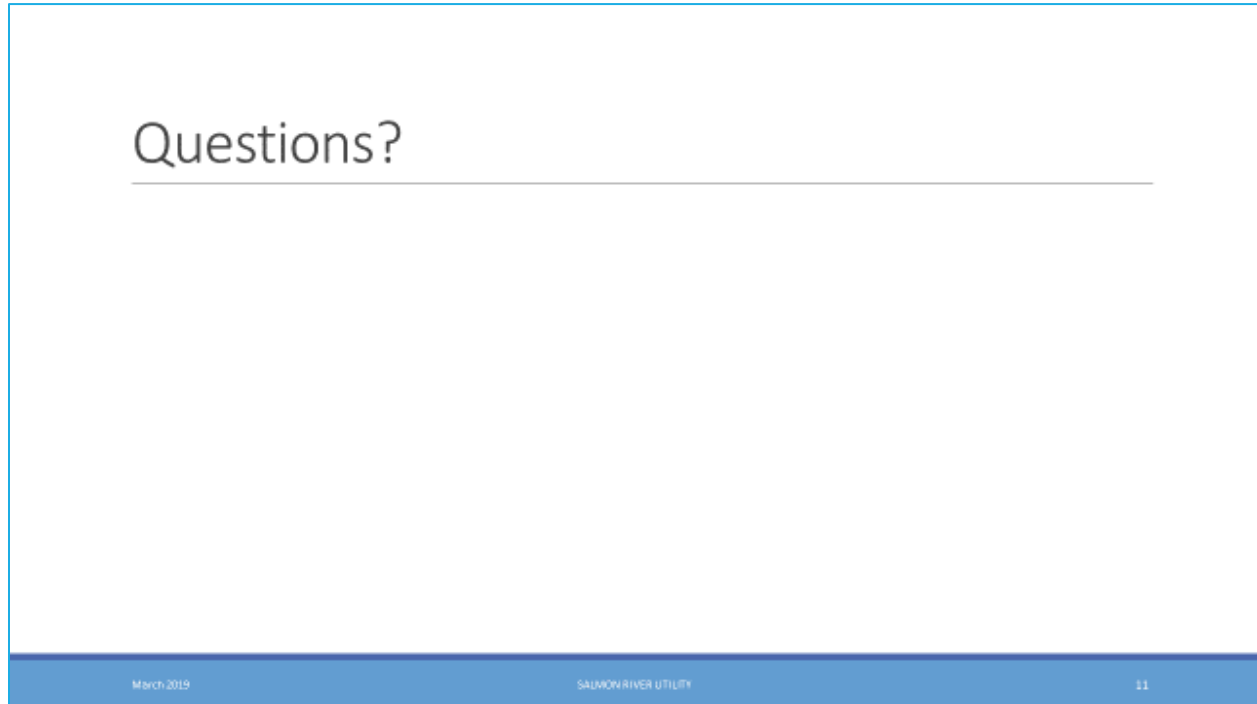
Operations *Inventory*

<u>FUEL INVENTORY</u>	<u>OTHER INVENTORY</u>	<u>WHAT IS BEING DONE</u>
Fuel remaining (gallons)		
Days of fuel remaining		
Next delivery expected		
<p>We <u>[do/do not]</u> have sufficient fuel to make it to the next delivery</p>		

March 2019
SALMON RIVER UTILITY
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➤ Questions

The manager should always give an opportunity for the board to ask questions and give suggestions.



Chapter 23: Monthly PCE Report

Section Contents:

Checklist Before Completing the UMR

Utility Data

Section A

Section B

Section C

Section D

Section E

In Case of Error

Checklist Before Submitting

The Utility Monthly Report (UMR) includes the information required for the Alaska Energy Authority to process PCE reimbursements. Filing the UMR should be relatively quick as it includes the data that is important for the utilities to manage their business. Reach out for help if you have questions. **The report is filed monthly within ten working days after the end of the billing period.** The latest date to report for the last month of the fiscal year is August 31.

If a utility submits data that is incorrect or difficult to understand, AEA will have to contact the utility for additional information. This will slow down the processing of payments and cause the utility to spend time and money to respond to questions by phone and/or email.

The standardized UMR in Microsoft Excel format (provided by AEA to each utility) can be printed and mailed as a hard copy to the US Postal Service. Print, sign, and include all supporting documents with the UMR:

- customer ledger,
- one copy of a residential bill, and
- one copy of a community facility bill. Make a copy for your office file.

The UMR is split into five sections (A-E) over two pages. Each section requires information about your electric utility regarding kWh sold, kWh generated and purchased, fuel consumed and non-fuel expenses. There are yellow fields and green fields. **You will enter data only into the yellow fields.** When the yellow fields are complete, the green fields will update automatically with a total.

Take the time to look in your filing cabinets and locate any past Utility Monthly Reports.. Place all of these reports in file folders according to the year. There should be twelve reports in each folder. These reports do not exist online. If you do not have them, you will have to contact the Alaska Energy Authority for copies of your past reports.

As you go forward, it is very important to keep a copy of your monthly PCE report. It contains very useful information that you can refer to and compare with future reports. Every June, the Alaska Energy Authority sends out a new blank UMR form. It will be for the upcoming fiscal year. If you do not have one, contact the Alaska Energy Authority.


Checklist before Starting the Utility Monthly Report

- A copy of the most recent Excel UMR template for your community
- Daily Powerhouse Inspection Reports for month
- Meter Reading sheet
- Completed Customer Ledgers
- Letter Order from RCA
- Accounting System for non-fuel information
- Income Statement

Power house inspection forms may be difficult to read if they are handwritten by different employees. If the utility records the inspections directly into a spreadsheet on a computer or tablet, it will be much easier to read and complete reports.

➤ Instructions for Completing the Utility Monthly Report (UMR)

The Utility Monthly Report (UMR)



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

FY2019 UTILITY MONTHLY REPORT - PLEASE COMPLETE ALL SECTIONS Page 1 of 2

Billing Period	/ / to / /	No. of Days	
Meters Read	/ /	Bills Mailed	/ /
Utility Name	ABC ELECTRIC UTILITY	Regulated:	Yes <input type="checkbox"/> No <input type="checkbox"/>
St. Address	_____		
City, State	_____		
Contact Name	_____	Phone No.	_____
	_____	Fax No.	_____
	_____	E-mail:	_____

➤ Utility Data

Billing Period: Enter the date of your billing period. (Example) 5/1/20XX – 5/31/20XX

No. of days: Enter the number of days in the billing period. (Example: number of days in the month)

Meters Read: Enter the date the meters were read. Meters should be read on the same day every month.

Bills Mailed: Enter the date the utility bills were mailed to your customers. (Example: 6/1/20XX)

Utility Name: This will be a green data field and the utility name will be already entered.

Regulated: Is your utility regulated or unregulated? Call 1-800-390-2782, Regulatory Commission of Alaska if you do not know.

Utility Address, Utility Phone Number, Utility City, State, and Utility Fax Number

Utility Contact Name: If a contractor fills this form out, these fields should contain the contractor's information, including the **Utility Email**.

The Utility Monthly Report is in an Excel spreadsheet. **At the beginning of each fiscal year, create a new file with the most current UMR for your community.** There should be a separate worksheet for each month of the year. All of these separate worksheets should be saved in one workbook. Worksheets can be labeled with the month and year name,

for example: July 19, August 19. When the first month is completed, copy and save it to the next month, then change it as needed.

➤ Section A

Section A						
1. DCCED Certified Community Population	321					
2. No. of Customers:						
Residential		Commercial		Community Facilities		
Federal/State Facilities		Unbilled Customers		Total	0	

1. DCCED-Certified Community Population

The population is provided by AEA before the beginning of the fiscal year (July). The population is used to determine the eligible kWh for community facilities per month. The formula is population multiplied by seventy. Green indicates that you can't change the information in that cell.

2. No. of Customers

The number of customers by class will be found in the customer ledger (further covered in Chapter 8). On a monthly basis, the utility should update the **customer ledger**—removing customers as accounts close and adding new customers when appropriate. Include donated/unbilled customers in this ledger. This count should be unique accounts, so a customer may have more than one account. If you are using the Excel form, the Total is calculated in the green cell.

Section B (2)							
1. kWh Generated and Purchased:							
Diesel:	<input type="text"/>	Hydro:	<input type="text"/>	Wind:	<input type="text"/>	Natural Gas:	<input type="text"/>
Total kWh Purchased:	<input type="text"/>	Purchased From / Vendor:			<input type="text"/>		
Other:	<input type="text"/>	Total kWh Available For Sale =		<input type="text" value="0"/>			
2. Price of fuel used by RCA to determine PCE rate: \$/gal.		\$	<input type="text"/>	Date Aprv.	<input type="text"/>	/	<input type="text"/>
3. Fuel Used (Gallons) ⁽²⁾	<input type="text"/>	Total Fuel Cost	<input type="text" value="\$ 0.00"/>				
4. Total Non-Fuel Exp:	\$ <input type="text"/>						

➤ Section B

1. kWh Generated and Purchased

From the [Power House Inspection Form](#) or the [SCADA report](#), record the total number of kilowatt-hours generated by each source (for example: Diesel, Hydro, Wind or Natural Gas) in the correct field. If your master meter uses a multiplier, you must multiply the reading by the multiplier.

$$(\text{Present Master Reading} - \text{Previous Master Reading}) \times \text{Multiplier} = \text{Total kWh generated}$$

Total kWh Purchased: Enter the total kilowatts-hours purchased during the reporting period (if any). When filling out the cells, every source should only be included once. For example, if the utility purchases wind power from a vendor, the purchased wind power should only be put into [Total kWh Purchased](#), and not [Wind](#).

Purchased from Vendor: Write the name of the vendor from whom you purchased the power.

Other: If any of the power is generated using any other source than those listed above, calculate the total number of kWh’s generated from this source and enter that number.

Total kWh Available for Sale: This cell is green. It will calculate Total kWh Available for Sale automatically.

POWER PLANT DAILY INSPECTION LOG PAGE 2 OF 2 SWITCHGEAR AND OPERATING GENERATOR																			
Comm./Oper.	In auto mode, no alarms	generators available	total KWH generated	station service KWH	running KW load	peak KW load [reset daily]	frequency [cycle]	line 1 voltage	line 2 voltage	line 3 voltage	line 1 amp	line 2 amp	line 3 amp	operating generator	total engine hours	engine water temp [normal]	engine oil pressure [normal]	engine oil level [normal]	battery voltage [normal]
Monday Date: 12/28	NO 3		977005	558403	50	80	60	483	488	477	52	51	95	3	2966.5	183.5	61	Full	30
Tuesday Date: 12/29	NO 3		977801	558451	67	62	60	483	488	477	52	51	95	3	2966.5	183.5	61	Full	30
Wednesday Date: 12/30	NO 3		978530	558482	76	69	60	483	488	477	52	51	95	3	2966.5	183.5	61	Full	30
Thursday Date: 12/31	NO 3		978501	558501	57	76	60	483	488	477	52	51	95	3	2966.5	183.5	61	Full	30
	NO 3		9785393	558500	62	81	60	483	488	477	52	51	95	3	2966.5	183.5	61	Full	30

On the power plant daily inspection log find:

1. Total KWH generated reading at end last billing cycle (9785393)
2. Total KWH Generated reading at end of current billing cycle (9812478)
3. Subtract the previous reading from the current reading
 $9812478 - 9785393 = 27,085 \text{ kWh}$

POWER PLANT DAILY INSPECTION LOG PAGE 2 OF 2 SWITCHGEAR AND OPERATING GENERATOR																			
Comm./Oper.	In auto mode, no alarms	generators available	total KWH generated	station service KWH	running KW load	peak KW load [reset daily]	frequency [cycle]	line 1 voltage	line 2 voltage	line 3 voltage	line 1 amp	line 2 amp	line 3 amp	operating generator	total engine hours	engine water temp [normal]	engine oil pressure [normal]	engine oil level [normal]	battery voltage [normal]
Monday Date: 1/29	NO 2		9808439	559272	81	96	60	487	490	480	66	70	152	2	19156.1	169	61	Full	129
	NO 2		9807081	559326	92	93	60	478	484	478	122	93	131	2	19164.1	165	64	Full	129
Tuesday Date: 30	NO 2		9810141	559417	84	88	60	482	488	480	97	72	132	2	19178.9	167	62	Full	127
	NO 2		9810710	559461	92	97	60	479	487	480	127	96	142	2	19185.9	169	61	Full	129
Wednesday Date: 31	NO 2		9812016	559570	79	90	60	482	490	480	93	61	132	2	19203.2	167	61	Full	128
	NO 2		9812478	559608	85	84	60	482	489	480	113	70	154	2	19209.3	165	61	Full	130
Thursday	NO 2		9813711	559711	54	61	60	480	480	480	76	80	154	2	19211.9	165	61	Full	130

2. Price of Fuel used by RCA to determine PCE rate \$/gallon

You can find this in the letter that the RCA sent you to tell you what your PCE rate is (PCE Memorandum for Fuel) or find it on their website (see Chapter 20 for more information). If you cannot locate the letter, contact the RCA at 1-800-390-2782. Following is an example of this PCE Memorandum, although your form may look different depending on the exact form used.

**Power Cost Memorandum
Fuel Cost Update**

Date: _____

Utility Name (Cert. No.)	Utility File No.	Date Filed:
--------------------------	------------------	-------------

PCE AMOUNT SUMMARY	Previously Approved PC59-0315H <u>Date Approved:</u> July 1, 2018	Staff Recommended Amount(s) and Effective Date PC59-0315I December 21, 2018
Class Rate	ALL	\$0.6794
<input type="checkbox"/> Interim <input checked="" type="checkbox"/> Permanent		<input type="checkbox"/> Interim <input checked="" type="checkbox"/> Permanent

Prior Fuel Purchase Price: \$ 4.9184 <input type="checkbox"/> Actual <input checked="" type="checkbox"/> Weighted Delivery Charge: _____ Surcharge Change: Previous	New Fuel Purchase Price: \$ <u>5.3118</u> <input type="checkbox"/> Actual <input checked="" type="checkbox"/> Weighted Updated
--	--

Weighted Average Fuel Price/Gal. Calculation					
	<u>Gallons</u>		<u>Price</u>		
On-hand before deliv.	2,824	X	4.9184	=	13,890
Delivered	27,691	X	5.3521	=	148,206
	<u>30,515</u>				<u>162,096</u>
					Weighted Average \$ 5.3119

Signed: _____ Utility Financial Analyst

Commission decision re. this recommendation :

	Date (if different from 12/20/18)	I CONCUR	I DO NOT CONCUR	I WILL WRITE A DISSENTING STATEMENT *

Special Instructions to Staff:

* If this column is initialed, Staff will contact the Commissioner for the statement, otherwise, dissent will simply be noted at the close of the By Direction Letter or Order.

Date Approved: This is the date that the RCA approved your PCE rate.



Note: The RCA price per gallon may be different from the price you paid for your most recent fuel purchase. You must list the weighted average cost price used by the RCA, as stated in the Letter Order.

3. Fuel Used (Gallons)

This is the amount of diesel fuel consumed by your generator(s) during this reporting period. The utility is required to have a fuel meter. The operator should record the fuel meter reading on the plant log three times per day. Below is an example of this plant log. **The operator should submit this form to the utility manager weekly.**

POWER PLANT DAILY INSPECTION LOG PAGE 1 OF 2 GENERAL PLANT STATUS

Time of Day	Outside Temperature	Inside Temperature	Plant and Site Secure [fence, door]	Exhaust Color [C=Clear, BL=Black]	Intermediate Tank Secure, [no leak]	Intermediate Tank Level [feet-in]	Day Tank Normal [power on, no]	Day Tank Meter Reading [gallon]	Oil Blender Normal [power on, no]	Off-line Generator Status [block]	Cooling System Status [exp. tank]	Heat Recovery Status [pumps on]	Room Lights Working	Ceiling and Exhaust Fans Working	Red Pilot Light Switches On	Fire Suppression Normal [agen]	Fire Extinguishers [in place and]	Gallons Used
12/28	70	68	60	OK	C	OK	4.2	on 83450	off 124	OK	OK	OK	OK	OK	OK	OK	OK	
12/28	100	59	60	OK	C	OK	4.2	on 83472	off 124	OK	OK	OK	OK	OK	OK	OK	OK	
12/28	96	59	60	OK	C	OK	4.2	on 83560	off 124	OK	OK	OK	OK	OK	OK	OK	OK	
12/30	90	59	60	OK	C	OK	4.2	on 83520	off 124	OK	OK	OK	OK	OK	OK	OK	OK	
12/31	90	58	60	OK	C	OK	3.0	on 83520	off 124	OK	OK	OK	OK	OK	OK	OK	OK	
12/31	700	59	60	OK	C	OK	3.0	on 83559	off 124	OK	OK	OK	OK	OK	OK	OK	OK	

To find the number of gallons of fuel used, use the power plant daily inspection log to find:

- Day tank meter reading at end last billing cycle
- Day tank meter reading at end of current billing cycle
- Subtract the current reading from the previous reading
 $838159 - 838859 = 2300 \text{ gallons}$

POWER PLANT DAILY INSPECTION

Time of Day	Outside Temperature	Inside Temperature	Plant and Site Secure [fence, door]	Exhaust Color [C=Clear, BL=Black]	Intermediate Tank Secure, [no leak]	Intermediate Tank Level [feet-in]	Day Tank Normal [power on, no]	Day Tank Meter Reading [gallon]	Oil Blender Normal [power on, no]	Off-line Generator Status [block]	Cooling System Status [exp. tank]	Heat Recovery Status [pumps on]	Room Lights Working	Ceiling and Exhaust Fans Working	Red Pilot Light Switches On	Fire Suppression Normal [agen]	Fire Extinguishers [in place and]	Gallons Used	
Monday	115	10	40	OK	C	OK	1'6.9"												
Date: 1/29	544	10	50	OK	C	OK	1'6.4"												
Tuesday	1130	15	50	OK	C	OK	1'5"	on 837972	off 134	OK	OK	OK	OK	OK	OK	OK	OK		
Date: 30	630	20	50	OK	C	OK	1'4.8"	on 838025	off 134	OK	OK	OK	OK	OK	OK	OK	OK		
Wednesday	1130	10	50	OK	C	OK	1'3"	on 838132	off 134	OK	OK	OK	OK	OK	OK	OK	OK		
Date: 31	615	10	50	OK	C	OK	1'2.5"	on 838159	off 134	OK	OK	OK	OK	OK	OK	OK	OK		

Total Fuel Cost: This is a green cell, so the number is calculated for you by Excel. The Total Gallons Used in Number 3 are multiplied by the price per gallon that was used by the RCA in Number 2.

(Price used by RCA to determine PCE Rate) x Fuel Used = Total Cost

4. Total non-fuel expenses

Enter your total non-fuel expenses from your **income statement**. These expenses are all of the expenses except Fuel. All of these are found in the utility's accounting system

in the Income Statement. **Make sure the dates of the report are accurate and that they are for the month you are reporting on.** If your utility has purchased any assets (for example, expensive equipment or generator overhauls) which will be depreciated, do not include these purchased assets. You will include the depreciation on these and your other assets, but only for one month. The values reported to AEA will not be reported to the RCA, and the fuel and non-fuel expenses must still be reported in the annual report (See Chapter 24).

Personnel Expenses:	
Total Compensation During Test Period	\$222,160.00
Employer Portion of Payroll Taxes	\$20,870.00
Workers' Compensation	\$7,001.00
TOTAL Personnel Expenses	\$250,031.00
Operating Expenses:	
Fuel Expense	\$183,115.00
Purchased Power	\$38,948.00
Generator Oil	\$2,423.00
Generator Filters	\$3,155.00
Generator Repairs/Maintenance (Parts and Freight)	\$13,750.00
Tools	-
Equipment Rental	-
Other (See Schedule A)	\$5,881.00
TOTAL Operating Expenses:	\$247,272.00
General and Administrative Expenses:	
Outside Professional Services	\$14,935.00
Insurance	\$10,701.00
Office Supplies	\$7,095.00
Postage	\$1,301.00
Office Rent	-
Travel	\$27,458.00
Training	-
Bad Debt Expense	-
RCA Fees	\$39.00
Other (See Schedule A)	\$15,485.00
TOTAL General and Administrative	\$77,014.00

Section C					
1. Station Service (Powerhouse Consumption): (kWh)(2)					
2. Peak Demand from Power Plant Log: (2)					
3. Total kWh Sold To:					
Residential		Commercial		Community Facilities	
Federal/State		Unbilled		Total Sold	0
4. "Total kWh Available for Sale" minus "Total kWh Sold" minus "Station Service"	0			LINE LOSS	
<i>(NOTE: This Number Should Be Greater Than Zero)</i>			<i>(Line Loss should be < or = 12%)</i>		

➤ Section C

1. Station Service (Powerhouse Consumption) kWh

Enter the number of station service kWh used in this space. The utility is required to have a meter that records the electricity consumed by the power plant for lights, pumps, fans and electronics. Station Service for the reporting period is the meter reading at the end of the reporting period minus the meter reading at the beginning of the reporting period. There is a meter in your powerhouse that measures this number.

Station service = Meter reading at the end of the reporting period – meter reading at the beginning of the reporting period

Please see the example on the following page.

POWER PLANT DAILY INSPECTION LOG PAGE 2 OF 2 SWITCHGEAR AND OPERATING GENERATOR

Comm./Oper.	In auto mode, no alarms	generators available	total KWH generated	station service KWH	running KW load	peak KW load [reset daily]	frequency [cycle]	line 1 voltage	line 2 voltage	line 3 voltage	line 1 amp	line 2 amp	line 3 amp	operating generator	total engine hours	engine water temp [normal]	engine oil pressure [normal]	engine oil level [normal]	battery voltage [normal]
Monday Date: 12-28	NO	3	977009	558403	50	80	60	483	488	477	52	51	95	3	2966.5	183	64	Full	13.0
Tuesday Date: 12/29	NO	3	977801	558461	67	60	60	483	488	477	52	51	95	3	2966.5	183	64	Full	13.0
Wednesday Date: 12/30	NO	3	978200	558482	76	60	60	483	488	477	52	51	95	3	2966.5	183	64	Full	13.0
Thursday Date: 12/31	NO	3	978501	558550	82	60	60	483	488	477	52	51	95	3	2966.5	183	64	Full	13.0

On the power plant daily inspection log find:

1. Station service KWH reading at end last billing cycle (558550)
2. Station service KWH reading at end of current billing cycle (559608)
3. Subtract the the previous reading from the current reading
 $559608 - 558550 = 1,058 \text{ kWh}$

POWER PLANT DAILY INSPECTION LOG PAGE 1 OF 2 SWITCHGEAR AND OPERATING GENERATOR

Comm./Oper.	In auto mode, no alarms	generators available	total KWH generated	station service KWH	running KW load	peak KW load	frequency	line 1 volta	line 2 volta	line 3 volta	line 1 amp	line 2 amp	line 3 amp	operating g	total engine	engine wat	engine oil P	engine oil le	battery voltage [normal]
Monday Date: 1/29	NO	2	9808439	559272	81	96	60	487	480	480	66	70	152	2	19156.1	169	61	Full	12.9
Tuesday Date: 30	NO	2	9810141	559417	84	88	60	482	488	480	97	72	132	2	19178.9	167	62	Full	12.7
Wednesday Date: 31	NO	2	9812016	559570	79	90	60	482	490	480	93	61	132	2	19203.2	167	61	Full	12.8
Thursday	NO	2	9812078	559608	85	84	60	482	489	480	113	70	154	2	19209.3	165	61	Full	13.0

2. Peak Demand from Power Plant Log

Peak Demand is the maximum kW load from the community within the month. From your plant log, look through the entire reporting period and write down your highest (peak) demand reading. Operators should log this value and re-set the meter each time the meter reading is taken. **These daily numbers are very useful for sizing the engine in the future.**

POWER PLANT DAILY INSPECTION LOG PAGE 2 OF 2 SWITCHGEAR AND OPERATING GENERATOR

Coms./Oper.	In auto mode, no alarms	generators available	total KWH generated	station service KWH	running KW load	peak KW load (reset daily)	frequency (cycle)	line 1 voltage	line 2 voltage	line 3 voltage	line 1 amp	line 2 amp	line 3 amp	operating generator	total engine hours	engine water temp (normal)	engine oil pressure (normal)	engine oil level (normal)
Monday Date: 12/28	Av 3		558903	50	80	60	60	477	477	477	52	51	45	3	19665	187.56	61	11.12
Tuesday Date: 12/29	Av 3		554951	67	62	60	60	477	477	477	52	51	45	3	19665	187.56	61	11.12
Wednesday Date: 12/30	Av 3		553400	7	69	60	60	477	477	477	52	51	45	3	19665	187.56	61	11.12
Thursday Date: 12/31	Av 3		552001	55	76	60	60	477	477	477	52	51	45	3	19665	187.56	61	11.12

On the power plant daily inspection log find:

1. Peak kW load
2. Look through all of the values and find the largest value during the current period

POWER PLANT DAILY INSPECTION LOG PAGE 2 OF 2 SWI

Coms./Oper.	In auto mode, no alarms	generators available	total KWH generated	station service KWH	running KW load	peak KW load (reset daily)	frequency (cycle)	line 1 voltage	line 2 voltage	line 3 voltage	line 1 amp	line 2 amp	line 3 amp	operating generator	total engine hours	engine water temp (normal)	engine oil pressure (normal)	engine oil level (normal)
Monday Date: 1/29	Av 2		552272	81	96	60	60	477	477	477	66	70	152	2	19156	167	61	11.12
Tuesday Date: 1/30	Av 2		551417	84	97	60	60	477	477	477	66	72	132	2	19178	167	62	11.12
Wednesday Date: 1/31	Av 2		551570	79	90	60	60	477	477	477	61	61	132	2	19203	167	61	11.12
Thursday Date: 1/31	Av 2		551570	85	89	60	60	477	477	477	61	70	154	2	19203	165	61	11.12

3. Total kWh Sold To

Enter the total amount of kWh sold to each customer class. This information should match the customer ledger submitted with your monthly report. These numbers will be added and the total will be calculated into the Total Sold field. See Chapter 8: Customer Invoices and Ledgers for more information.

	Number of customers	kWh Used		Charges	
		Total	PCE eligible	Energy	Other
Residential	15	3,497	2,861	\$2,622.75	\$75.00
Commercial	4	13,103	-	\$9,827.25	\$125.00
Community Facilities	3	5,254	5,254	\$3,940.50	\$30.00
State and Federal	1	344	-	\$258.00	\$30.00
Unbilled	0				
Total	23	22,198	8,115	\$16,648.50	\$260.00

4. Line loss

The line includes the text "Total kWh Available for Sale (see section B1) minus Total kWh Sold (See C3 above) minus Station Service (see C1 above)"

This number should always be greater than zero, because it is impossible to sell more than you have. Contact the Alaska Energy Authority if this number is less than zero. A utility's line loss is calculated as follows:

$$\text{Line loss} = \frac{\text{kWh generated} - \text{kwh sold} - \text{station service}}{\text{kWh generated}}$$

Line loss is the percentage of electricity that is generated that cannot be accounted for by sales or station service. If the Line Loss is greater than 12% during the test period, the RCA will reduce the utility's PCE rate. High Line Loss values can be because of metering and billing errors or physical losses within the distribution system.



Tip: Use line loss as a red flag. Review your data if line loss is high or below zero.

Section D

1. Current Residential price per kWh prior to PCE Credit (i.e., .4823 per kWh)					
2. PCE Eligible kWh:					Totals
Residential kWh: (3,4)					0
<small>Comm. Facility Max kWh = 22,470</small>					
Community Facilities kWh (5,6)					0
Total Eligible kWh:	0	0	0	0	0
Present PCE Rate: (¢ per kWh)					
** 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 D

1. Current Residential price per kWh prior to PCE Credit

Enter your current residential rate. This number is the utility’s price per kWh using four decimal places (Example: .4850).

The small red type “Comm. Facility Max kWh” provides a calculation so that the community facility’s limit is not exceeded. This calculation is the Community Population (from Section A) times 70 kWh per person. The green field at the end of the Community Facility row must not be greater than the Community Facility Max kWh.

2. PCE Eligible kWh

This section includes four rows and five columns. Each yellow column represents an approved PCE rate. If your utility only has one electric rate, use only the first column. The following chart will be used as an example for completing Section D, No. 2

	Number of customers	kWh Used		Charges	
		Total	PCE eligible	Energy	Other
Residential	15	3,497	2,861	\$2,622.75	\$75.00
Commercial	4	13,103	-	\$9,827.25	\$125.00
Community Facilities	3	5,254	5,254	\$3,940.50	\$30.00
State and Federal	1	344	-	\$258.00	\$30.00
Unbilled	0				
Total	23	22,198	8,115	\$16,648.50	\$260.00

To complete Section D, No. 2 start with the 4th line, Present PCE Rate. There are four spaces going across that will hold up to four different PCE rates. In the following example there are two PCE rates, a Residential PCE rate of .4032 and a Community Facility PCE rate of .3625.

Use the Customer Ledger (see the preceding chart) to find the Total Eligible kWh. For residential and community facilities enter the number of kWh eligible for PCE. Make sure that you put the values in the column that reflects the present PCE rate for that customer type.

In this example, there were 2,861 Residential kWh eligible for PCE and 5254 Community Facility kWh eligible for PCE. The utility has no other PCE rates, therefore the other columns are blank.

PCE Eligible kWh:					Totals
Residential kWh: (3, 4)	2861				2861
Community Facilities kWh (5, 6)		5254			5254
Total Eligible kWh:	2861	5254			8115
Present PCE Rate: (per kWh)	.4032	.3625			
Total PCE Credit (\$)	\$1153.56	\$1904.58			\$3058.13

The value of the PCE credit is calculated by the spreadsheet and is included in the bottom, far right column.

<p>Section E: Certification</p> <p>I hereby certify that the information submitted to the Alaska Energy Authority in support of (name of utility)</p> <p style="text-align: center;"><u>ABC Electric Utility</u></p> <hr/> <p style="text-align: center;">in participation with the Power Cost Equalization Program is true and correct to the best of my knowledge.</p> <hr/> <p style="text-align: center;">(Certifying Officer) (Date)</p>		<table border="1"> <tr> <td>Vendor No: <u>ABCEU</u></td> <td>Community Code: <u>339999</u></td> </tr> <tr> <td>Payment Method (Circle One):</td> <td>CHECK ACH</td> </tr> <tr> <td>Accounting:</td> <td></td> </tr> <tr> <td>Approval for Payment:</td> <td></td> </tr> <tr> <td>Calculated Payment:</td> <td style="background-color: #e0ffff;"></td> </tr> <tr> <td>Adjustment:</td> <td style="background-color: #e0ffff;"></td> </tr> <tr> <td>Disbursed Amount:</td> <td style="background-color: #e0ffff;"></td> </tr> </table> <p>STAGE CODE _____ BATCH NO. _____</p>	Vendor No: <u>ABCEU</u>	Community Code: <u>339999</u>	Payment Method (Circle One):	CHECK ACH	Accounting:		Approval for Payment:		Calculated Payment:		Adjustment:		Disbursed Amount:	
Vendor No: <u>ABCEU</u>	Community Code: <u>339999</u>															
Payment Method (Circle One):	CHECK ACH															
Accounting:																
Approval for Payment:																
Calculated Payment:																
Adjustment:																
Disbursed Amount:																

3

➤ Section E

Section E Certification is important. The utility must certify that the information is true and correct. The information in this report is very important because it will determine the amount of PCE reimbursement that a utility will receive. This reimbursement will help customers reduce their energy costs and the data will help the state figure out the best way to assist Alaskan communities with high energy costs. Many different groups use this data from PCE to understand how people use energy. If the data is not accurate, the state and other groups will be less effective in helping Alaska communities.

The boxed section to the right of Section E Certification is for AEA’s use. Please do not enter anything in this box.

Completing and submitting Page 2 of the UMR is optional. Using your customer ledger, enter the names of your community facilities that have been certified by the Alaska Energy Authority to be eligible for PCE reimbursement. Be sure to include your Streetlights. Next to the community name, enter the number of kWh usage during the reporting period. This will be automatically added and the total entered in the field labeled Total Eligible Community Facility kWh. Enter the current PCE rate. The spreadsheet will multiply kWh consumed times rate. This is Total PCE Credit.

for all kWh that are generated and can inform the utility about streetlight energy usage and unnecessary usage.

If a community decides to not meter its streetlights (statute allows this), a calculation can be used to estimate the average monthly consumption from the streetlights. The section above entitled “Streetlights” provides the calculation. You only need to have the wattage of the bulbs and the number of lights. To use the calculator, fill in the values in the yellow cells. If the streetlights do not all have the same wattage, you will need to do the calculation for each different wattage.

Number of Street Lights	Metered		Unmetered	
Wattage of Bulb				

➤ In Case of Error

If AEA determines there was a mistake in your UMR, and they will not pay the amount you requested, they will send a Remittance Letter to your utility explaining exactly why they changed the amount of your payment. Always read these letters so you don’t make the same mistake again – it may be that you are giving credit to a community facility that has not been certified as eligible by AEA.

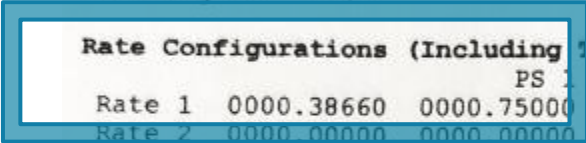
Every community facility should have an application for PCE on file with the Alaska Energy Authority. Do not give credit until their application has been approved by AEA.

If your utility has prepay electric meters, print an Electronic Detail Report to include with your monthly UMR Packet. Contact your provider with any questions. In the example included below, the first column after Rate 1 is the Residential Rate for the first 500 kWh, and the next column (PS1) is the full rate after 500 kWh.

Account Number: [REDACTED] Account Name: [REDACTED]

Current Rate Plan

Rate Id : RES
 Version No : 24
 Date Created : Jul 02 2018 13:26:00
 CreditMode : Pre-Payment Mode
 Description : Residential
 Effective from: Jul 02 2018
 Configuration : Power Based
 Tax Value : 0%
 Fuel Adjust : \$0



Rate Configurations (Including Tax and Fuel Charges)

		PS 1	PS 2	PS 3
Rate 1	0000.38660	0000.75000	0000.00000	0000.00000
Rate 2	0000.00000	0000.00000	0000.00000	0000.00000
Rate 3	0000.00000	0000.00000	0000.00000	0000.00000
Rate 4	0000.00000	0000.00000	0000.00000	0000.00000

Power Switches
 PS 1: 500 PS 2: None PS 3: None

Time Switches
 None

Holidays
 Holiday Rate: 0
 Meter contactor remains closed for configured Holiday dates: No

Future Rate Plan

No rate plan assigned

End of Customer Report

➤ Checklist before Submitting

- Do the numbers on this report make sense? For example, is line loss too high or a negative number?
- Double check your numbers for accuracy. Use the finance, powerplant, meter read and other inspection reports to verify.
- Compare your numbers to your last report. Are there any numbers that are drastically higher or lower? Can you explain these differences?
- Is your report signed?
- Is the customer ledger included?
- Is the monthly electronic detail report included, if applicable?
- Have you included a copy of a community facility invoice?
- Have you included a copy of a residential invoice?

Chapter 24: Annual PCE Report

Section Contents

Page 1: Utility's Residential Electric Rates

Page 2: Utility's Community Facility Electric Rates

Page 3: Balance Sheet

A More Descriptive Balance Sheet

Page 4: Income Statement

Accrual vs. Cash Basis

Electric Income

Expenses

Page 4A: Income Statement for Other Expenses

Page 5: Electric Utility Data Form

Page 6: Depreciation & Amortization

Page 7: Certification

The Regulatory Commission of Alaska requires that utilities submit a PCE Annual Report by a date issued to the utility. The required filing date is not the same for all utilities. Included within the report is a certification from the utility that all of the information included in the report is true and correct. If it is determined that the utility knowingly submitted an incomplete or inaccurate report, the utility can be held accountable by fines and suspension from the PCE program. If a utility does not submit all the information required, or if the RCA believes there are reasons to question some of the financial information provided, the RCA will disallow the expenses and potentially recommend suspension from the program until the information has been received and processed by the RCA.

The Annual Power Cost Equalization Report for Nonregulated Utilities is a seven-page report template available in Microsoft Excel. One of the purposes of the financial section of this manual is to help electric utilities set up their accounting system so that the creation of this report is easy. Starting with Chapter 1: Chart of Accounts, the utility can structure

The utility's electric rate is multiplied by 500

$$\$0.65 \times 500 = \$325.00$$

The PCE floor rate is subtracted from the utility's electric rate

$$\$0.65 - \$0.1667 = \$0.483$$

UTILITY
NAME: NAME OF ELECTRIC UTILITY

CALCULATION OF AVERAGE CLASS RATE PER kWh

CURRENT RATES

Utility's electric rate

PCE floor rate

Rate Schedule: Residential		Customer Charge:				
(1) Block (by kWh)	(2) Rate (\$/kWh)	(3) Surcharge (\$/kWh)	(4) Total (\$/kWh) (2+3)	(5) Total \$ (1x4)	(6) Avg. (\$/kWh) (5)/(1)	(7) Avg. Rate (\$/kWh) \$ 0.1667
to	0.6500		0.6500	325.0000		
to						
to						
to						
Max	500		Total	325.0000	0.6500	0.4833

If your utility charges a monthly customer charge, include this information above column (7). The customer charge will be added in the total of column (5). While there is an error in the spreadsheet provided, the customer charge is included in the calculation for the average \$/kWh and should be included on Page 1.

If your utility includes a surcharge, such as fuel surcharge, in addition to a rate, that will go in column (3).

➤ **Page 2: Utility's Community Facility Electric Rates**

Page 2 is where the electric rate for Community Facilities will go. Some utilities have a separate rate for residential and community facilities. Some utilities have one rate for all customer classes.

In the following example, the utility has the same rate for residential and community facilities. It is entered in Box 2 and the spreadsheet calculates Boxes 4 and 6. Box 6 is the utility electric rate minus the PCE floor rate.

UTILITY
NAME: NAME OF ELECTRIC UTILITY

CALCULATION OF COMMUNITY FACILITY AVERAGE RATE PER kWh

CURRENT RATES

Rate Schedule:	Community Facility	Customer Charge:		
(1) Block	(2) Rate/ kWh	(3) Surcharge (\$/kWh)	(4) Total (\$/kWh) (2+3)	(6) Average Rate(\$/kWh)- \$ 0.1667
to	0.6500		0.6500	0.483300
to				
to				
to				

If your utility charges a monthly customer charge, include this information above column (7). The customer charge will be added in the total of column (5). While there is an error in the spreadsheet provided, the customer charge is included in the calculation for the average \$/kWh and should be included on Page 2.

If your utility includes a surcharge, such as fuel surcharge, in addition to a rate, that will go in column (3).

➤ Page 3: Balance Sheet

See Chapter 6 for a complete discussion of Balance Sheets. The Balance Sheet submitted to RCA may look quite different from a QuickBooks Balance Sheet. The utility may use the RCA version or the balance sheet from accounting software. As explained in Chapter 6, a balance sheet consists of all of the Assets, Liabilities and Equity in your utility.

It is important that the utility track the information on the balance sheet. It is through the balance sheet that the manager and board can understand the financial health of the utility. If the accounting system is set up to track the balance sheet and the bookkeeper stays on top of the work, filing the balance sheet to the RCA will be easy. Before running the balance sheet report, make sure that your accounting system is up to date. Following are some suggestions:

- Enter in any vendor bills for the reporting year you are working on
- Enter in any customer payments for the reporting year you are working on
- Reconcile your Checking, Savings and Cash accounts

The following page includes a sample balance sheet from the RCA Annual Report with the most common accounts for a PCE-eligible utility:

BALANCE SHEET ACCOUNTS		
Acct#		
ASSETS		
101	Electric Plant in Service	\$ 213,655
110	Accumulated depreciation and amortization of electric utility plant	116,896
	Net Plant In Service	96,759
107	Construction work in progress- Electric	-
	Total Utility Plant	96,759
		-
121	Nonutility property	-
122	Accumulated depreciation and amortization of nonutility property	-
130	Cash and working funds	125,125
142	Customer accounts receivable	187,861
144	Accumulated provision for uncollectible accounts-credit	-
151	Fuel Stock	-
154	Plant materials and operating supplies	-
174	Miscellaneous current and accrued assets	-
186	Miscellaneous deferred debits	-
190	Accumulated deferred debits	-
	Total Assets	\$ 409,745.00
EQUITY		
201	Common stock issued	\$ -
204	Preferred stock issued	-
211	Miscellaneous paid-in capital	-
215	Appropriated retained earnings	-
216	Unappropriated retained earnings	-
218	Noncorporate proprietorship	287,227
	Total Equity	287,227
LIABILITIES		
224	Other long-term debt	120,000
232	Accounts payable	2,518
235	Customer deposits	-
236	Taxes accrued	-
237	Interest accrued	-
242	Miscellaneous current and accrued liabilities	-
252	Customer advances for collection	-
253	Other deferred credits	-
	Total Liabilities	122,518
		-
	Total Liabilities and Equity	\$ 409,745.00

Account 101 Electric Plant in Service: On Page 6 of the annual report, you will find the Schedule of Depreciation. This page contains all of the allowable assets in your utility along with their purchase price. These assets include expensive tools, repairs to generators, and equipment purchases. Many rural Alaska utilities have had much of their utility infrastructure paid for by state and/or federal grants. Since grants do not count as

either a liability (the utility does not owe anyone for the grant) or as equity (since the utility did not invest in the grant), a grant-funded asset will not show up on the balance sheet like other assets. **Assets purchased with grant money are not allowed to be depreciated.** Therefore, your actual power plant or anything else paid for with grant money will not be listed on Page 6. Make sure you update Page 6 for the current year before transferring the values to this Balance Sheet. After updating Page 6, take the total from the column labeled COST and enter it in next to Account 101.

Account 110: Accumulated Depreciation and Amortization of Electric Utility Plant: Go to Page 6 of this annual report to the Schedule of Depreciation. The last column labeled Accumulated Depreciation contains the most current value of Accumulated Depreciation for each asset in the Cost Column. Enter the total of this column next to Account 110.

REMEMBER, Page 6 must be updated for the current year before you can complete the Balance Sheet spreadsheet.

The Balance Sheet spreadsheet will automatically subtract Accumulated Depreciation (Account 110) from cost of Total Assets (101). The total will automatically be entered into Net Plant in Service and in Total Utility Plant.

Account 130 Cash and Working Funds: Checking and Savings accounts including any cash boxes and your Safe. All of these cash accounts should be reconciled.

Account 142 Customer Accounts Receivable: This should be the total of all your unpaid customer invoices. Or you can think of this as the balance due from all of your electric customers added together.

Total Assets: This box will be automatically calculated by the Balance Sheet.

Account 224: Other long-term debt includes all long-term, greater than one year, debt. Since the RCA has not included the potential long-term debt accounts, this account would cover all long-term notes and bonds. Common sources of long-term debt include AEA's Power Project Loan Fund, the USDA Rural Utility Service, banks, and credit unions.

Account 232 Accounts Payable: Enter the total of all your unpaid vendor bills. If this is the only Liability, the Balance Sheet will enter this number into Total Liabilities.

Account 218 Noncorporate Proprietorship: This number is Total Assets minus Total Liabilities

Total Liabilities and Equity: This number will be Total Liabilities plus Account 218 Noncorporate Proprietorship.

An Electrical Utility can also use their QuickBooks Accounting Software Balance Sheet instead of completing Page 3 of the RCA form. Make sure your Balance Sheet is accurate and that all of the cash accounts are reconciled. Look it over to ensure there are no negative numbers on the QuickBooks Balance Sheet.

➤ Full Description of RCA Balance Sheet Accounts

It is not necessary to include all of the accounts included on the RCA Balance Sheet as some may not apply to your situation. There might also be other accounts that would be more applicable. It is important the utility track the types of assets, liabilities, and equities that the utility has.

What follows are a definition of each account on the RCA Balance Sheet form:

Account 101 Electric Plant in Service: On Page 6 of the annual report, you will find the Schedule of Depreciation. This page contains all of the allowable assets in your utility along with their purchase price. These assets include expensive tools, repairs to generators, and equipment purchases. Many rural Alaska utilities have had much of their utility infrastructure paid for by state and/or federal grants. Since grants do not count as either a liability (the utility does not owe anyone for the grant) or as equity (since the utility did not invest in the grant), a grant-funded asset will not show up on the balance sheet like other assets. Assets purchased with grant money are not allowed to be depreciated. Therefore, your actual power plant or anything else paid for with grant money will not be listed on Page 6. Make sure you update Page 6 for the current year before transferring the values to this Balance Sheet. After updating Page 6, take the total from the column labeled COST and enter it in next to Account 101.

Account 110: Accumulated Depreciation and Amortization of Electric Utility Plant: Go to Page 6 of this annual report to the Schedule of Depreciation. The last column labeled Accumulated Depreciation contains the most current value of Accumulated Depreciation for each asset in the Cost Column. Enter the total of this column next to Account 110.

Net Plant in Service is a calculation that subtracts the Accumulated Provision for Depreciation and Amortization of Electric Utility Plan from the Electric Plant in Service. Net

Plant in Service should agree with the book value on the Schedule of Depreciation and Amortization.

Account 107: Construction Work in Progress includes plant that has not been put into service. This includes the design, installation, and construction of engines and generators, wind turbines, and distribution systems. The assets will be transferred to Electric Plant in Service when they are put into service. The Construction Work in Progress account is a good reminder for the utility to get the system in service as soon as is practical, as the utility cannot depreciate Construction Work in Progress until the asset is put in service. If the asset is never put into service the utility will have to petition the RCA to be able to amortize the asset.

Account 121: Nonutility property includes other long-term assets with a value over \$5,000 that are not used directly to generate or distribute power. Common nonutility property includes welders, cranes, trucks and all-terrain vehicles.

Account 122: Accumulated depreciation and amortization of nonutility property includes the depreciation and amortization of the nonutility property in account 121. This follows the same rules as in Account 110 (Accumulated Provision for Depreciation and Amortization of Electric Utility Plant.)

Account 130: Cash and Working Funds include all cash and cash-like accounts. This account will include physical cash that the utility may hold, any bank accounts, and other funds that could be convertible to cash within a business day. The utility should balance how much cash it holds at any time. The utility needs to have sufficient cash on hand to cover the current liabilities and other expected or unexpected costs, but not too much cash. Cash in excess of what is needed for current liabilities or as a "rainy day fund" should either be reinvested into the utility to improve service or reduce costs to consumers.

Account 142: Customer Accounts Receivable—Electric includes the amounts due from customers for utility service, which is bills that are yet to be paid. If the Customer Accounts Receivable account increases over time, this is likely a sign that the utility is having difficulty collecting from customers.

Account 144: Accumulated provision for uncollectible accounts—credit includes an annual estimate of the amount of accounts receivable which may be uncollectible. It is labeled as a credit in this account as it will reduce the utility's total assets. This account should be consistent with the Bad Debt expense on the Income Sheet.

Account 151: Fuel Stock includes the book cost of fuel on hand. The method for calculating the book cost should be consistent with the Non-Regulated PCE Fuel and Purchased Power Cost Report Form, adjusted for the actual number of gallons of stock on hand. The fuel stock should be included in this account regardless if the fuel was purchased with cash or a loan. If the utility was gifted the fuel the utility should follow the same guidance for recording other grant-funded assets.

Account 154: Plant Materials and Operating Supplies includes the cost of materials purchased primarily for use in the utility business for construction, operation and maintenance purposes. It also includes the book cost of materials that were recovered from the electric plant during improvement activities and can be reused or sold as scrap. Plant Materials and Operating Supplies should not include those materials that are used within the year, such as filters and oil, instead these should be expensed on the Income Sheet and not included as an asset.

Account 174: Miscellaneous current and accrued assets include other short-term assets that are not reported elsewhere.

Account 186: Miscellaneous deferred debits include prepaid expenses, such as prepaid insurance.

190 Accumulated: deferred debits

Total Assets is the sum of all utility assets. Accounts with credits (such as depreciation accounts and the accumulated provision for uncollectible accounts) will reduce the value of the total assets.

Account 201: Common stock issued, 204 Preferred stock issued, and 211 Miscellaneous paid-in capital are for investor owned utilities. The accounts include the value of the stocks issued by the utility. Some cooperatives may have stock as well.

Account 215: Appropriated retained earnings include retained earnings that have been put into a restricted account. Retained earnings are created when the utility has positive net revenue; that is, it makes a profit. The funds in the restricted account could be because of internal or external reasons. For instance, a lender may require a certain amount to be included in a reserve account or the utility's governing board may require a specified amount for a rainy day fund. The funds in this account are not able to be used for purposes besides what the appropriation indicates.

Account 216: Unappropriated retained earnings are similar to appropriated retained earnings, except that they are not earmarked for any particular purpose. Unappropriated retained earnings can be used for any purpose that the utility chooses.

Account 218: Noncorporate proprietorship includes investor-owned utilities that are not corporations and do not sell stocks.

Cooperatives may have member's equity, which is left off of the RCA form.

Municipal- and tribal-owned utilities may have other forms of equity not included on the RCA form.

Total Equity is the sum of all forms of utility equity. A utility's equity should stay steady or increase over time. If equity drops, it is a sign that the utility is having financial problems.

Account 224: Other long-term debt includes all long-term, greater than one year, debt. Since the RCA has not included the potential long-term debt accounts, this account would cover all long-term notes and bonds. Common sources of long-term debt include AEA's Power Project Loan Fund, the USDA Rural Utility Service, banks, and credit unions.

Long-term debts should be split into the current amount of the debt, that is the amount to be paid in the year, and the long-term debt that will not be paid off within the year. The current portion of long-term debt is not included on the RCA form.

Account 232: Accounts payable includes all amounts payable by the utility within one year, which are not provided for in other accounts. Common accounts payable item includes services, bulk fuel loans, and other short-term liabilities. If accounts payable continues to rise month-to-month or year-to-year, this is a sign that the utility is likely not paying its bills or that expenses are raising quicker than revenue can be collected.

Account 235: Customer Deposits are included if the utility takes a security deposit from customers. Since the utility will have to repay the security deposit to the customer in the future (generally 12-24 months), the utility has a liability it must cover. Payments on prepaid meters would also be included in this account.

Account 236: Taxes Accrued include the amount of taxes that the utility owes and has not yet paid at the end of the period.

Account 237: Interest Accrued includes the amount of interest that the utility owes and has not yet paid at the end of the period. Interest which is added to the principal of the

debt on which incurred should not be included here, but included in the appropriate debt account.

Account 242: Miscellaneous Current and Accrued Liabilities includes the amount of all other current and accrued liabilities not provided for elsewhere. The most common types of Miscellaneous Liabilities are rentals, payroll, employees' vacations and holidays, insurance, and other.

Accrued Rentals include unpaid joint use pole rentals, if the utility rents the pole from another entity, and other rentals that the utility has not paid for at the end of the reporting period.

Accrued Payroll includes the salaries and wages at the end of an accounting period that the utility has not yet paid.

Accrued Employees' Vacations and Holidays includes the liability for accrued wages for employees' vacation, holidays, and sick leave. If an employee receives paid vacations, holidays, and/or sick leave, the utility must be able to cover the employees' non-productive time. If employees do not take their vacations and holidays or more employees are added to staff, it is expected that this liability will increase.

Accrued Insurance is most commonly used in case of workmen's compensation and public liability insurance. A liability exists when the insurance payment that had been estimated is less than what is actually needed to cover the needs of the insurance.

Account 252: Customer Advances for Construction includes customer prepayments for things such as line extensions and connection fees.

Account 253: Other Deferred Credits This account shall include advance billings and receipts and other deferred credit items.

Total Liabilities is the sum of all forms of utility liability. Unless the utility has made a capital purchase financed by debt, if liability increases, it is a sign that the utility is potentially having financial problems.

Total Liabilities and Equity should equal the value found under the line item Total Assets. If the two values do not equal each other, do not balance, then the manager should determine which part(s) of the balance sheet are incorrect.

➤ Page 4: Income Statement

Please refer to Chapter 4: Income Statement. If you set up your Chart of Accounts like the one in this chapter, filling out the Income Statement for RCA should not be difficult. Make sure that the dates of the Income Statement from QuickBooks have the same dates as the reporting period for the Annual PCE Report. Once again, make sure that your QuickBooks file is up to date.

- Enter in any vendor bills for the reporting year you are working on
- Enter in any customer payments for the reporting year you are working on
- Reconcile your Checking, Savings and Cash accounts

Accrual vs Cash Basis

Income is money earned from the sale of goods or services. In the case of electric utilities income is the sale of electricity. There are two methods of accounting known as the Accrual Basis and the Cash Basis. These methods determine when your electric income is recorded. Thinking about the electric utility, the Accrual Basis means that when the electric invoices are sent out at the beginning of the month, the income is recorded on the Income Statement the day the invoices were created, even though these invoices have not yet been paid.

The Cash Basis means that the electric income is recorded as the electric invoices get paid. If most of the invoices in an electrical utility are paid each month, there won't be much difference between the monthly income recorded in the Accrual Basis or the Cash Basis. Some communities, however, have a problem collecting payment for their invoices. In that case, the difference between total income for the invoices sent out and money received for invoices paid could be large.

When a utility is reporting income for the annual RCA report, report the customer invoices that have been sent out (Accrual Basis), even if they have not been paid. QuickBooks has a way of switching back and forth so that the Income Statement can be quickly viewed in the Cash Basis or the Accrual Basis. The utility should create an expense account for unpaid bills, **bad debt**, to capture the uncollected payments.

Looking at the following Income Statement, notice that the income is reported by customer class. Other income coming from grants and pole rentals is reported separately.

NAME OF ELECTRIC UTILITY	12/31/2016
INCOME STATEMENT	
Utility Operating Income	
Sales Revenues	
Residential	\$ 269,161
Commercial	226,326
Community Facilities	32,094
Federal/State Facilities	7,204
<i>TOTAL Sales Revenue</i>	534,785
Other Income	
Grants	-
Pole Rentals	-
Wasteheat In-kind	-
Other (See Schedule A)	93,109
<i>TOTAL Operating Income</i>	627,894

➤ Electric Income

The income on the Income Statement is income that primarily comes from electricity sales to customers. All utilities must have rates for each class of customer (residential, commercial, community facilities, federal/state facilities). Some utilities have a single rate for all kilowatt-hours sold in the community, whereas others may have numerous rate classes. No matter how a utility chooses to structure the rates, it is important that the utility ensure that customers are being charged properly. If the customer and billing system is not set up properly, the utility will not be charging customers properly and the income collected by the utility will be incorrect.

The RCA separates electric income into four classes; it is not required that there are different rates for each customer class, but the rates for each class should be consistent with the cost of producing and delivering power to each of the customer classes. The amount of income reported for each class should be the amount collected. PCE payments from the state are not broken out separately.

The number of kWh sold for each class is not reported to the RCA on the Income Statement in the annual report. Only the income is reported. The kWh sales by class must be reported to AEA on a monthly basis in the UMR Report.

Other Types of Electric Income

Penalties

When customers fail to pay a bill on time, they should be charged a penalty. It costs money for the utility to recover these late payments.

Customer Charge

If customers are charged a monthly fee, the customer charge should be in the income section.

Connect/Disconnect Fees

Electric utilities often provide additional services to customers such as service hook-ups or disconnects, and meter replacements. The costs of providing these services are recovered through service charges.

Other Income

Some utilities receive significant income from other sources besides sales of electricity. Grants, pole rentals, and waste heat sales are examples of other income sources which are common across PCE-eligible communities.

Grants

Grants can come from a number of sources: the city, tribal, state and/or federal government, foundations, non-governmental organizations (NGOs), or other sources. When a utility receives a grant, the grantor does not expect a service or good in return for providing the grant. A grant can be provided to a utility as an operational or capital grant. Grant funding cannot be depreciated. If the utility pays a portion of the project, this portion can be depreciated.

Pole Rentals

Pole rentals are often used for the use of electric poles. These are primarily for telephone wires.

Waste Heat In-Kind

Waste heat In-kind is the value of a sales agreement for delivering excess heat from the power house's heat recovery system to heat buildings. Heat recovery systems are generally quite cost effective, and income from the system both reduces the amount of rate income needed and provides an incentive for the utility to maintain the system. Remember, that if income is being reported for the heat recovery system, the operational expenses also need to be reported.

Other (See Schedule A)

Other (See Schedule A) includes all other utility income sources and should be included on Page 4A of the annual report. A common 'other' utility income source is fuel sales. If fuel sales are part of a utility's owner's line of business (such as a tribe that owns the utility and the local fuel dispensary), the fuel sales should be separated from the utility accounts and the fuel should not be reported to the PCE program.

Total Operating Income

Total Operating Income is the sum of all the Income.

➤ Expenses

The PCE program will only reimburse expenses paid for by the utility. These PCE reimbursed expenses must be appropriate for customers to pay for. Grant-funded costs are generally not included in PCE reporting. However, from the utility's perspective it is important for grant-funded expenses to be included in the yearly analysis because the utility manager needs to know the total cost of operating the utility even if the construction costs operating expenses are paid for with a grant. This is especially true if it is possible that the expenses paid for by the grant funds may need to be paid for by another source of income in the future.

Allowable Expenses

For utilities that are not economically regulated, expenses are submitted to the RCA only for the purpose of being eligible for the PCE program. Two broad rules developed through legal precedents since the 19th century provide a good way to understand why certain expenses may or may not be allowed by the PCE program. The first is the "Used and Useful Principle"

which is an idea that utility expenses and investments must benefit the current ratepayers.¹ This means that the expense must be used to provide service to the customers (used) and serve a customer need such as reducing costs or improving reliability (be useful). This means that current customers should not pay for infrastructure or services that do not provide service.

The next rule is the “Prudent investment rule”², which is a general test to see if a utility investment was reasonably priced and/or necessary. Since electric utility customers do not have a choice of other providers, this rule aims to ensure that they are not being charged for unreasonable costs. Neither the “Used and Useful Principle” or “Prudent Investment Rule” keeps a utility from incurring expenses, but it may mean that an expense will not be reimbursed by PCE.

Before accounting for utility expenses, it is important that the utility have a separate system of accounts for tracking expenses and income, this is especially true if the utility is part of a larger entity, such as a municipality or tribe. A utility should aim to be sustainable—both financially and technically—and the first step is to know the actual costs of operating the utility. At the very least, utility income should not be used to pay for non-utility expenses, such as other tribal or municipal costs.

Utility expenses should be paid by the utility. If another entity in a community, either the city or tribe or other organization, chooses to cover utility costs, be it fuel or personnel costs, the costs need to be accounted for so that the utility knows the total cost of utility operations. The costs will not be allowable expenses for PCE reimbursement because they were not paid for by the utility. Instead, the external funds used to purchase the fuel or personnel costs would be considered a form of income, unless the utility is owned by the city and city funds are being for utility purposes. Intentionally reporting costs that were not paid for by the utility as utility expenses to the RCA can result in fines and the utility can be removed from the PCE program.

¹ https://en.wikipedia.org/wiki/Used_and_Useful_Principle

² https://en.wikipedia.org/wiki/Prudent_Investment_Rule

Categories of Expenses

The annual Income Statement, shown as Figure 1, is divided into two main sections: 1) Utility Operating Income; and 2) Expenses.

Refer to the section, The Chart of Accounts on Pages XX to read about account categories for both the Balance Sheet and the Income Statement.

The expense section of the Income Statement is broken into four categories:

- Personnel Expenses
- Operating & Maintenance Expenses
- General & Administrative Expenses
- Other Expenses

Personnel Expenses

Personnel Expenses consist of the following:

- Wages (Total Compensation)
- Payroll Taxes (Employer Portion of Payroll Taxes)
- Workers' Compensation

Personnel expenses include all expenses associated with the people directly employed by the utility. A utility has three general functions that frequently require staff time: management, clerks, and operators. Utility managers are ultimately responsible for ensuring the financial and operational health of the utility. Utility clerks generally bill customers and fill out the monthly PCE forms submitted to AEA. The operators run the powerhouse, perform maintenance, and ensure that the utility provides stable and reliable power to customers. Depending on the size of the utility, each position may require only a part-time employee, whereas other utilities may require multiple people to fulfill each function.

If the utility is part of a larger organization (either the city or tribal government) and personnel serve multiple functions in the organization (such as the utility clerk also acting as the city clerk), personnel time should be divided accurately for all functions.

All utility personnel functions should be paid for by utility income. The one exception is for city-owned utilities that allocate staff time. *For example:* If the same person is the utility clerk and city clerk, the city-owned utility can count, or allocate, a portion of the clerk's time to the utility.

Total Compensation

Total Compensation includes all salaries and fringe benefits for all employees. Fringe benefits include medical insurance, retirement plans, the value of rent if housing is supplied, and meals. If other people are hired to do work that are not employees, their expense should be included under Operating Expenses or General and Administrative Expenses, depending on the nature of the work performed.

Employer Portion of Payroll Taxes

Employer Portion of Payroll Taxes include only the portion of FICA (Social Security), Medicare, and Alaska unemployment tax that is required by the employer. The employees' contributions are not included since it comes from their wages.

- FICA tax (or Social Security) is 6.2% of gross wages.
- Medicare is 1.45% of gross wages.
- Alaska unemployment tax (or Employment Security Tax) is the amount established by the State of Alaska. See Chapter 2: Utility Financial Tasks for a discussion on the Alaska Unemployment tax

Workers' Compensation

Workers' Compensation [insurance] is required by state law. A utility can get workers' compensation insurance from private insurers or be self-insured. The utility should encourage all employees to promptly report any job-related injuries and illnesses. Prompt reporting can limit liability for the utility.

TOTAL Personnel Expenses

Total Personnel Expenses is the sum of all of the line items under the Personnel Expenses section (Total Compensation + Employer Portion of Payroll taxes + Worker compensation).

Operating & Maintenance Expenses

Operating Expenses:	
Fuel Expense	-
Purchased Power	-
Generator Oil	-
Generator Filters	-
Generator Repairs/Maintenance (Parts and Freight)	-
Tools	-
Equipment Rental	-
Other (See Schedule A)	-
TOTAL Operating Expenses:	-

Operating and Maintenance expenses include items and activities that are necessary to ensure the long-term, on-going operation of the utility. Operations & Maintenance costs are expenses that are actually related to operating and maintaining the electric utility.

Fuel Expense

Fuel Expense is the largest single expense for most utilities. The fuel expense is driven by both the unit cost of the fuel and the number of gallons consumed over the year. **It is important that the utility tracks the cost per gallon, the number of gallons purchased and the number of kWh per gallon.**

$$\text{Fuel expense} = \text{Price per gallon} \times \text{number of gallons}$$

The total yearly cost of the fuel is included on the Income Statement under "Fuel Expense" in the annual PCE report, but the number of gallons consumed per month is also reported on Page 5 of the annual report. If a utility needs assistance getting a loan for bulk fuel, the State of Alaska's Division of Community and Regional Affairs' Bulk Fuel Loan Program is available.¹ If a utility has overdue fuel loans, expenses associated with this are not eligible for PCE reimbursement.

Purchased Power

Purchased power is reported if the utility purchases power from an independent power producer (IPP) or other power supplier. For unregulated utilities, it is the responsibility of the utility manager and governing board to ensure that the utility customers are paying a fair price for the purchased power. For the purpose of the PCE program, a utility is

¹ <https://www.commerce.alaska.gov/web/dcra/BulkFuelLoanProgram.aspx>

required to report the amount and cost of purchased power monthly to AEA and annually to the RCA. The RCA maintains the right to investigate and determine if the purchased power expense is fair and can determine how much of the expense will count towards the PCE level set by the RCA.

Purchased power is also reported on Page 5 of the PCE Annual Report and on the Non-regulated PCE Fuel and Purchased Power Cost Report Form.

Generator [Engine] Oil

Generator [engine] oil includes the cost of lubricants needed for the engine. The exact schedule for the oil changes is based on each manufacturer's specifications, but for most engines it is between 250-1000 hours of runtime between changes. This means if an engine is run 24 hours a day the oil would need to be changed 10-40 times per year.

Generator [Engine] Filters

Engine filters includes oil filters for the engine, which are replaced on the same schedule as oil changes, and various other filters required for the engine including: fuel filters, air filters, filters in the coolant system, etc.

Generator [Engine] Repairs/Maintenance (Parts and Freight)

Generator [engine] repairs/maintenance (Parts and Freight) includes routine maintenance expenses that do not extend the life or change the value of the engine and generator. Routine maintenance expenses include coolants, belts, and hoses. Expenses for repairs to the distribution system can be included here or under Page 4A ("Other Operating Expenses").

The utility should also keep track of all repairs and maintenance expenses not paid for by the utility, including AEA's Circuit Rider program. Although these will not be reported to the RCA for reimbursement through the PCE program, since they are not expenses incurred by the utility, these external services should still be accounted for by the utility, so that the utility management has a true picture of the total cost of running the utility. In order to budget for the future, the utility needs to know all current and past costs for providing utility services. The utility may need to be able to pay for those services through ratepayers if they are not available through state or federal programs.

Tools

Tools are hand tools and power tools. It was suggested in Chapter 1: The Chart of Accounts that a utility have one expense account for expensive tools and another expense account for inexpensive tools. If you separate your tool expenses into two accounts (for example, one for tools greater than \$500 and one for tools less than \$500), when it is time to create the RCA annual report it will be very easy to locate purchases for those tools (greater than \$500) that will get depreciated.

It was also suggested to create an expense account for each generator in your utility (for example, Generator 1, Generator 2 and Generator 3 expense accounts if you have three generators). You will use these to track generator repairs and/or overhauls greater than \$500. This will help in several ways. You will readily be able to see which generator (if any) is receiving repairs/overhauls. Expenses in these accounts will probably be allowed by RCA as depreciable and there will be no searching for these items at the end of the year. Any labor, travel and parts associated with these repairs/overhauls should be included in the specific generator account.

Equipment Rental

Equipment rental includes all equipment that is rented to perform utility day-to-day tasks. If equipment is rented to perform work for capital projects, those expenses should be included in the project's capital cost and included under "Depreciation Expenses".

Other

Other operational expenses are included on Form 4A of the Annual Power Cost Equalization Report for Unregulated Utilities. Depending on the choices made by the utility, other expenses can include costs for the distribution system, renewable energy systems and metering.

Total Operating Expenses

Total Operating Expenses sums up all of the line items under the Operating Expenses section (Fuel expense, Purchased power, Generator oil, Generator filters, Generator repairs/maintenance, Tools, Equipment rental, Other).

General & Administrative Expenses

General and Administrative Expenses:	
Outside Professional Services	-
Insurance	-
Office Supplies	-
Postage	-
Office Rent	-
Travel	-
Training	-
Bad Debt Expense	-
RCA Fees	-
Other (See Schedule A)	-
TOTAL General and Administrative	-

In addition to the Operating & Maintenance costs, an electric utility must perform work in order to provide the financial, regulatory, and legal management of the utility. General & Administrative costs include office expenses for billing customers, insurance, office supplies, bad debt, interest on loans, and insurance.

Outside Professional Services

Outside Professional Services include services that do not directly support the generation and distribution of electricity. Depending on the needs of the utility, these services can include auditors, legal services, bookkeepers, consultants that compiled the PCE Annual Report, and other "office workers".

Insurance

Although insurance is not required by any state or federal agencies, except as a condition for a loan, a utility should carry liability and property insurance to protect itself and its assets from unforeseen events.

Liability insurance protects the utility from lawsuits that arise from various utility activities. **General Liability** protects the business from the cost of failure to major facilities, such as transmission lines and storage tanks, and from suits arising from accidents that occur to individuals who are injured as a result of entering an unsafe area that is owned or controlled by the business, such as falling from the top of a powerhouse. **Directors & Officers Insurance** protects the policy-making body and the staff from malpractice suits, including employment lawsuits. Additional liability insurance can be purchased for other specific needs and/or extend the amount of coverage.

Property and Casualty Insurance can be purchased to protect the utility's property, including grant-funded property, from fire, theft/vandalism, and water damage. The utility can also be protected against the cost of unexpected equipment breakdowns. The utility's insurance premiums will reflect the value of the utility's property and an analysis of the risk.

Since it is in the insurance company's best interest to limit their exposure to risk, many insurance companies have personnel specifically tasked with providing risk assessments to their policyholders. The recommendations provided to the utility can be a valuable tool from a disinterested third-party to identify potential improvements to the utility.

Adequate insurance benefits the utility by reducing the need for a reserve account to cover unexpected events. For instance, instead of having a reserve account with sufficient funds to cover an unexpected breakdown of an engine (\$100,000 or more), insurance can be purchased to assist with these potential issues. Obviously, there will be conditions and events, such as negligence, that will not be covered by an insurance policy.

Office Supplies

Office supplies are common items such as paper and pens, and more specific supplies such as preprinted letterhead and envelopes, checks for the various bank accounts, and forms or booklets. A utility could also choose to include other lower cost items such as printers, computers, scanners, and faxes, under office supplies.

Postage

Postage includes the cost of stamps and also freight. Be sure not to double count freight expenses associated with Operational Expenses, all expenses should only be counted once.

Travel

Travel expenses can be incurred for both employees (full or part-time paid workers) and utility officials, (board, and/or council). Travel expenses include the direct cost of transportation, per diem, lodging, and other. Transportation includes airfare, automobile mileage allowances, taxis and any other form of essential transportation expense incurred on official business. Per diem is paid to an employee or official to cover the cost of lodging and meals. Lodging is backed up with receipts, and a Meals Per Diem is usually on top of lodging to cover meals and includes tips. Other charges may include telephone, parking

fees (not parking tickets), emergency purchases of supplies, and other charges to complete official business.

Training

Training expenses are those associated with training utility personnel to perform their jobs. If the utility did not pay for the entire cost of training, as may be the case for AEA-sponsored power plant operator or bookkeeper training, only the expense that the utility paid will be an eligible expense when being reported to the RCA. Conference fees are also included.

If the training is associated with bringing a new asset into service, such as a newly installed wind turbine or a new make of engine, and specialized training is need to ensure the safe and efficient operation of the asset, the training can be added to the capital cost of the asset and included under "Depreciation expenses."

RCA Fees

RCA fees include a number of fees required by the RCA. Fees are charged when utilities submit a fuel report (\$39), request a rate change (\$39), or request a change in the fuel surcharge (\$39). A fee is also levied when the RCA analyzes the Annual Power Cost Equalization Report for Nonregulated utilities in order to recalculate the PCE level (\$471). This is done approximately every three years or at the utility's request.

Bad Debt Expenses

Bad debt expenses can be confusing. The bad debts are not the utility's debts. **Bad debt expenses are the unpaid and uncollected customer bills that the utility has written off and does not expect to collect.** The bad debt expense line item spreads the unrecovered income over all the utility customers.

Prior to writing off bad debt expenses, a utility should have an internal policy about how to decide that a debt is not expected to be collected. The policy could be a set time period (generally 12-18 months) or some other factor. The DCRA has an excellent guide, written

for water and wastewater utilities, that gives guidelines on how to improve a utility's bill collection rate.¹

Bad debt expenses are included in the income statement as a way to account for collection rates that are less than 100%. Reporting bad debt also allows the utility to recover the expense through customer rates and is a reimbursable expense for setting the PCE rate.

Other

Other General and Administrative expenses should be included on Form 4A of the Annual Power Cost Equalization Report for Nonregulated Utilities under "G&A Expenses." Other expenses include:

- Utilities, internet, and phone for the office and/or powerhouse
- Stipends for officials, board members, or council members for utility activities.
- Meeting fees such as facility rentals and teleconference charges. Note that if travel for a meeting is requested, the expense should go under the travel line item.

If the expense is not related to the function of the utility, such as scholarship funds, donations, and other charitable activities, the expenses will not be counted as an eligible expense by the RCA. The utility and governing body decide if the ineligible activities are important functions for the utility to continue supporting as the program would come out of utility profit.

TOTAL General and Administrative

Total General and Administrative sums up all of the line items under the General and Administrative section: Outside Professional Services, Insurance, Office Supplies, Postage, Travel, Training, Bad Debt, RCA fees, and Other G&A expense.

¹

<https://www.commerce.alaska.gov/web/Portals/4/pub/Utility%20Collections%20Handbook.pdf?ver=2016-10-07-112921-043>

Interest & Depreciation Expense

Interest expense includes the amount of interest paid in a given year for loans. The interest paid is reimbursable by the PCE program. The most common loans that rural Alaska utilities hold are for bulk fuel purchases, but a number of utilities have loans through AEA's Power Project Loan Fund or various USDA programs. If the interest payments on a capital loan start prior to the project being put into service, the interest payments should be included in the capital cost and depreciated. If a utility bank or investment account earns interest, then that should be included as income in the section.

Depreciation expense is an accounting method to estimate the loss of an asset's value over time. An asset is something that has value that will be used to generate income for the utility in the future. Common utility assets include engines and generators, meters and transformers, computers and other office equipment. Improvements to assets, especially engine overhauls, which increase the life or performance of the asset can also be included under depreciation. See the section for Page 6: Depreciation and Amortization later in this chapter for more information.

➤ Page 4A: Income Statement for Other Expenses

Page 4A of the Income Statement is used for expenses that do not fit into any of the accounts on the Income Statement.

INCOME		OPERATING EXPENSES		G & A EXPENSES	
ITEM	PRICE	ITEM	PRICE	ITEM	PRICE
		4-wheeler tire repair	\$ 59	Phone/Fax/Internet	\$ 7591
		4-wheeler supplies	615	Stipends	5350
		Distribution parts and supplies	1138	Supplies	2544
		Fuel for 4-wheelers	2426		
		Distribution Costs	778		
		Cleaning supplies	865		

➤ Page 5: Electric Utility Data Form

Each month after the customer ledger has been updated, the utility should update the YTD spreadsheets. One of these spreadsheets will be used to complete Page 5 of the annual PCE report. Looking at the following spreadsheet, notice that the form has totals for each month for kWh generated, kWh sold, gallons of fuel consumed and kWh used by Station Service. These numbers are tracked on the Power Plant Log.

ELECTRIC UTILITY PCE DATA FORM

Test Period: **October 2016 through September 2017**

MO.	KWH GENERATED			KWH SOLD	GALLONS CONS.	STAT. SVC.
	DIESEL	HYD/WIND	TOTAL			
OCT	46,000		46,000	33,163	3,412	2,342
NOV	35,000		35,000	29,887	3,191	2,500
DEC	39,100		39,100	33,031	3,144	2,623
JAN	35,200		35,200	30,057	3,181	2,245
FEB	32,100		32,100	27,079	2,814	2,339
MAR	25,200		25,200	21,385	2,242	1,804
APR	24,600		24,600	21,234	2,171	2,112
MAY	31,100		31,100	27,400	2,707	2,590
JUN	33,300		33,300	27,490	2,813	2,115
JUL	37,000		37,000	30,983	3,093	2,613
AUG	42,100		42,100	35,663	3,620	2,239
SEP	48,200		48,200	38,864	4,025	2,776
TOTAL	428,900		428,900	356,236	36,413	28,298

➤ Page 6: Depreciation and Amortization

At the end of the year, if a utility has kept large-dollar operating purchases and repairs/overhauls separated into the Generator and Large Tool accounts, it should be easy to complete the Depreciation Schedule. Any assets purchased in the year should be looked at and organized. If there were any large repairs or overhauls, group the vendor receipts together for each repair: labor, travel, parts, freight. If the large repair or overhaul was for a specific generator, label the receipts. When all of the purchases, large repairs and overhauls have been grouped, enter each one on a separate line in the Depreciation table. See Chapter 6 for a more complete discussion of Depreciation.

When a new asset is initially brought into service, all of the costs associated with bringing it into service should be totaled and depreciated. These costs can include:

- Studies (wind study, conceptual design, final design),
- Interest and principal paid prior to the asset being put into service
- Personnel expenses that were incurred in the design and construction of the asset. It is important that the personnel expenses are not double counted, if the expenses were already reported under Personnel Expenses, they should not be counted here
- Any hard and soft costs of infrastructure
- Training needed for personnel to operate the asset
- Expenses that were necessary for meeting safety and regulatory requirements
- Repairs and overhauls required to ensure the on-going operation of the facility

What cannot be depreciated?

If the utility did not pay for the asset, then it will not count as an eligible expense for the RCA in calculating the PCE level. The most common reason why an asset cannot be included is that it was paid for by state or federal grants. Additionally, if the asset was paid for through a community contribution, a regional entity, or other non-ratepayer or equity investor, the costs cannot be recovered through rates. The utility should still track the depreciation of grant-funded infrastructure so that it can plan for the future replacement of the infrastructure.

If the capital costs did not result in an asset that is being used by the utility to produce or deliver power to customers, the utility cannot recover the costs. Examples of the types of

costs that could result in ineligible capital costs include studies and reports that do not lead to an operational project, and unused or underutilized infrastructure. If the utility is unable to recover the costs from ratepayers, it could result in the utility having to cover the expense through another method or could even lead to bankruptcy, as has happened to PCE-eligible utilities.

If a utility has a capital cost that is ineligible because it is not used or useful, the utility can petition the RCA, which can make a determination if the expenses can be amortized. If the RCA makes the determination that the expenses are allowed, then the capital costs can be amortized based on an agreed upon schedule.

Expected Life

All assets have an expected life, also called a useful life. The expected life is simply how long the asset is expected to remain useful. At the end of its life, the asset will have no value on the books, even if it is still operational and being used by the utility. Different types of assets have different expected lives.

Depreciation expenses are reported because utility assets, such as engines or powerhouses, are expected to last many years. If the asset was not 100% grant-funded, the utility will need to be able to recover the cost of the asset. The utility recovers costs by charging ratepayers. Since the asset is being used over multiple years, the cost is recovered over multiple years—the expected life of the asset. This also protects the ratepayer from large changes in rates to cover the cost of the asset. The cost of the asset is spread out over many years instead of just when it was purchased.

In most cases, the amount recovered by the utility is the same every year. This is called straight-line depreciation. Straight-line depreciation divides the cost of the asset by the number of years of the expected life, so that an equal percentage of the asset's value is depreciated every year (the annual rate).

Calculating straight-line depreciation is not difficult. For example, assume that a new small engine cost \$100,000 to install. The expected life of the small engine is 5 years. That means that the depreciation expense for the small engine will be 20% per year.

$$\text{Depreciation expense} = \$100,000 / 5 = \$20,000$$

In this case, the utility would be able to recover \$20,000 per year from ratepayers for the infrastructure.

Following is an example of an asset purchase of a Turbo Charger and a large repair made to a generator:

Purchase

Turbo Charger
Vendor: GE Mechanical
\$5,079
Useful life: 5 years

Large Repair

Generator 1
Vendor: GE Mechanical
\$27,459
Useful Life: 5 years

Expect Life Table (RCA)

The Useful Life is obtained from the following RCA chart.

ASSET	EXPECTED LIFE (years)
Generators	14
Transformers	20-25
Poles, Towers	25
Overhead Lines	25
Underground Conduit	25
Meters	20-25
Services	25
Buildings	30
Office Equipment	10
Vehicles	4-6
Fuel Tanks	15
Computers	6
Street Lights	20
Power State Meters/Displays	10
Small Engines	5

<u>Asset</u>	<u>Fiscal</u> <u>Year</u>	<u>Cost</u>	<u>Life</u>	<u>Accum</u> <u>Dep</u>	<u>Book</u> <u>Value</u>	<u>FY</u> <u>2019</u>	<u>Accum</u> <u>Dep</u>	<u>Book</u> <u>Value</u>
	<u>In-</u> <u>Service</u>			<u>01/01/19</u>	<u>1/1/2019</u>	<u>Depreciation</u>	<u>12/31/2019</u>	<u>12/31/2019</u>
Street Lamps 2	1998	666	20	\$ 583	\$ 83	\$ 33	\$ 616	\$ 50
Prepay Metering	2007	25,970	10	\$22,075	\$ 3,895	\$ 2,597	\$ 24,672	\$ 1,298
New School Powerline	2009	62,152	20	\$21,756	40,396	\$ 3,108	\$ 24,864	\$ 37,288
FAA red LED Light	2010	4,200	10	\$ 2,310	\$ 1,890	\$ 420	\$ 2,730	\$ 1,470
Ferguson Enterprises, Inc.	2015	5,685	5	-	\$ 5,685	\$ 1,137	\$ 1,137	\$ 4,548
GE Mechanical	2015	8,080	5	\$ 1,616	\$ 6,464	\$ 1,616	\$ 3,232	\$ 4,848
GE Mechanical *	2015	20,036	5	\$ 2,004	\$ 18,032	\$ 4,007	\$ 6,011	\$ 14,025
HP Printer Replacement	2015	1,558	5	\$ 156	\$ 1,402	\$ 312	\$ 468	\$ 1,090
Honda Foreman	2015	5,025	5	\$ 503	\$ 4,522	\$ 1,005	\$ 1,508	\$ 3,517
Smart Meters	2015	5,709	10	\$ -	\$ 5,709	\$ 571	\$ 571	\$ 5,138
GE Mechanical - Turbo Charger – Generator 1	2016	5,079	5	\$ -	\$ 5,079	\$ 1,016	\$ 1,016	\$ 4,063
GE Mechanical – Gener. 1	2016	<u>27,459</u>	5	<u>\$ -</u>	<u>27,459</u>	<u>\$ 5,492</u>	<u>\$ 5,492</u>	<u>\$ 21,967</u>
Total		<u>171,619</u>		<u>\$51,003</u>	<u>\$120,616</u>	<u>\$ 21,313</u>	<u>\$ 72,316</u>	<u>\$ 99,303</u>

The purchase and the large repair have been entered into the depreciation table on the previous page. The depreciation will start at the end of 2016 for both of these assets. The cost is divided by the useful life and the depreciation expense for the current year (\$1,016 for the Turbo Charger and \$5,492 for the large repair).

Each year, the current year's depreciation is added to the column labeled Accumulated Depreciation and, when the Accumulated Depreciation is subtracted from the Cost, a new Book Value is calculated for the end of the year. Note that after one year's depreciation, the Turbo Charger is valued at \$4,063 and the Repair is valued at \$21,967.

Each year, the accumulated depreciation will increase and the book value will decrease for a specific asset until it has been fully depreciated.

At that point, the book value will be zero. In this example, the Depreciation Expense for the entire year for all assets is \$21,313.00.

If the utility does not have a depreciation schedule, an initial inventory of all assets should be conducted, taking note of if the asset was grant-funded or paid for by the utility. Only assets that the utility has paid for can recover depreciation costs through rates (and thus be reimbursed by the PCE program), but **the utility should still track the depreciation of all assets**. This will help the utility plan for upcoming major expenses. The columns need to be updated every year but if the schedule is maintained on a yearly basis, as it should be for the annual report, it should be a relatively easy task. Filling out the depreciation for each asset requires straightforward addition and subtraction.

R&R Accounts

Although the business plans sponsored by AEA and Denali Commission for many power houses built since 2000 have suggested and/or required that utilities set up an account for repair and replacement (R&R account), deposits into the account are not allowable expenses for setting the PCE rate. **Saving for a future event is not considered an expense, because the utility has not actually spent money on a product or service.** Additionally, charging current customers for future expenses could be considered not fair for current customers. Since customers should only be charged for the cost of delivering the utility service, saving for future upgrades and/or replacement does not directly benefit the current customers, and are not allowed expenses.

➤ Page 7: Certification

The certification page requires all of the contact information for the electric utility such as name, email address, address, and telephone number. Don't forget to sign and date this document. Make sure to keep a copy of this report where you can easily locate it. You may need to look at it throughout the year. Also, it will serve as a great guide when you go to create this report again next year.