

ALASKA ENERGY AUTHORITY
VILLAGE POWER SYSTEM ASSESSMENT

Community: **Buckland**
Evaluation Date: **9/20/12** Time Started **1830** Completed **2100**
Evaluator(s): **Ben Hopkins**

*** Indicates that only one from the group shall be chosen. Otherwise choose all that apply**

Powerhouse Building

Site Location

- ☒ Site suitable for powerhouse
- ☐ < 100 feet from a public well
- ☐ < 25 feet from an eroding bank or beach, or in a flood plain

*** Foundation**

- ☒ Powerhouse on acceptable foundation (pad & post, piling, concrete, etc.)
- ☐ Powerhouse directly on gravel pad or light timbers (raised timbers, on permeable gravel)
- ☐ Powerhouse directly on tundra or natural soils (no foundation)
- ☐ Powerhouse leaning considerably or unstable foundations (seismic hazard)

*** Flooring**

- ☐ Welded steel deck plate or concrete (sealed)
- ☐ Steel deck plate or concrete (unsealed)
- ☒ Wood (sealed or painted)
- ☐ Wood (non-sealed or bare)

*** Interior Walls**

- ☐ Concrete or metal skin
- ☒ Fiberglass reinforced paneling (FRP)
- ☐ Gypsum board
- ☐ Wood (painted or sealed)
- ☐ Wood (non-painted or bare)

*** Exterior Walls**

- ☒ Concrete or metal siding
- ☐ Wood (painted or sealed)
- ☐ Wood (non-painted or bare)

*** Roof Penetration**

- ☒ None
- ☐ Properly installed (rain tight)
- ☐ Minor leaks (repairable)
- ☐ Major leaks (not repairable)

*** Ventilation**

- ☒ Proper ventilation (air intake & exhaust fans, louvers & hoods)
- ☐ Adequate ventilation (air intake & exhaust fans)
- ☐ Minimum ventilation (air intake)
- ☐ No ventilation (doors or windows have to be left open)

*** Lighting**

- ☒ Excellent lighting
- ☐ Adequate lighting
- ☐ Poor lighting
- ☐ No lighting

Security

- ☐ Powerhouse fenced in & door locks
- ☐ Door locks
- ☒ No fence
- ☐ No door locks

Generator Equipment and Installation

Diesel Engines

	Unit #1	Unit #2	Unit #3	Unit #4	Unit # 5
kW	476	476	180	_____	_____
Hours of Operation	25131	23595	1059	_____	_____

* Generator Condition

	Unit #1	Unit #2	Unit #3	Unit #4	Unit #5
Good, like new	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fair	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor, guards/covers missing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Load Sizing

- ☒ Properly sized generation to meet the community loads
- ☐ Undersized generation to meet the community loads
- ☐ Oversized generation to meet the community loads

* Load Balance

- ☐ <10% Imbalance
- ☐ 10% to 25% Imbalance
- ☒ >25% Imbalance

* Control Switchgear

- ☒ Fully automatic synchronizing switchgear
- ☐ Semi-automatic synchronizing switchgear
- ☐ Manually synchronizing switchgear
- ☐ Manual transfer switches
- ☐ Manual mounted breakers

* Electrical

- ☒ Wiring appears appropriate
- ☐ Exposed wiring, improper grounding, missing covers etc.

* Fuel System Inside Powerhouse

- ☒ Welded piping
- ☐ Welded & threaded piping
- ☐ Threaded piping
- ☐ Rubber hose

Fuel System Appurtenances

- ☐ No day-tank
- ☐ Additional for active leaks

Totalizing & Station Service Meter

- ☒ Properly installed and working totalizing & station service meter
- ☐ No totalizing meter
- ☐ No station service meter

*** Fuel Meter**

- ☒ Properly installed & working fuel meter
- ☐ No fuel meter

Environmental

Interior of Powerhouse

- ☒ Clean, well-kept
- ☐ Old generator part stored inside facility
- ☐ Waste oil stored inside facility
- ☐ Apparent oil spills

Under Facility

- ☒ Clean, well-kept
- ☐ Old generator part stored under facility
- ☐ Waste oil stored under facility
- ☐ Apparent oil spills

Surrounding of Powerhouse

- ☐ Clean, well-kept
- ☒ Old generator part stored on site
- ☒ Waste oil stored on site
- ☐ Apparent oil spills

*** Waste Oil Disposal**

- ☒ Waste oil blending system
- ☐ Waste oil incinerator
- ☐ Drum or tank storage for waste oils

*** Life, Health, & Safety**

- ☐ Code Compliant
- ☒ Low risk
- ☐ Medium risk
- ☐ High risk
- ☐ Potential for loss of life

Electrical Distribution Line Evaluation

Overhead Distribution System

* Pole type

- ☒ Fully treated poles
- ☐ Butt treated poles
- ☐ Native pole (trees)

* Pole installation

- ☐ Proper depth (can be determined by the manufacture's mark or button on pole)
- ☒ Within 12 inches of recommended depth
- ☐ Within 24 inches of recommended depth
- ☐ Greater than 24 inches of recommended depth

* Pole alignment

- ☐ Poles straight
- ☒ Poles leaning less than 10°
- ☐ Poles leaning greater than 10°

* Distribution voltage

- ☒ =>7200 volts
- ☐ 2400 volts
- ☐ 480/277 volts
- ☐ 208/120 volts

* Anchors

- ☐ Properly installed (<12 inches of the anchor rod exposed)
- ☐ 12 - 24 inches of the anchor rod exposed
- ☒ >24 inches of the anchor rod exposed

* Primary conductor

- ☐ Appears properly installed (sag, conductor size, etc)
- ☒ Improperly installed (conductor needs resagging, etc)

* Service conductor

- ☐ Appears properly installed (sag, conductor size, etc)
- ☒ Improperly installed (conductor needs resagging, etc)

*** Meter installation**

- ☒ Appears to be properly installed (height, grounding, etc)
- ☐ Improperly installed (height, no ground, etc)

*** Meter Condition Residential & Commercial**

- ☐ Good (appears in good condition)
- ☒ Fair (minor corrosion)
- ☐ Poor (major corrosion, needs replacing)

*** Over all condition of the system**

- ☐ Excellent (no repairs needed)
- ☒ Good (minor repairs, re-sag guys, re-sag service drops, etc.)
- ☐ Poor (major repairs needed, pole, guy, conductor, meter replacement, etc)

Underground Distribution System

*** Primary conductor**

- ☐ Appears to be properly installed
- ☐ Exposed conductor

*** Transformers**

- ☐ Appears to be properly installed
- ☐ Improperly installed (no pad, leaning, etc)

*** Service conductor**

- ☐ Appears to be properly installed
- ☐ Exposed conductor

Operator Proficiency

* Meter Reading

- ☐ Excellent
- ☒ Good
- ☐ Acceptable
- ☐ Unacceptable

* Daily Logs

- ☐ Excellent
- ☐ Good
- ☒ Acceptable
- ☐ Unacceptable

* Routine Maintenance

- ☐ Excellent
- ☒ Good
- ☐ Acceptable
- ☐ Unacceptable

* Scheduled Maintenance

- ☐ Excellent
- ☒ Good
- ☐ Acceptable
- ☐ Unacceptable

* Maintenance Planning

- ☐ Excellent
- ☒ Good
- ☐ Acceptable
- ☐ Unacceptable

Waste Heat Recovery

* Waste Heat Recovery Operational

☒ Yes

☐ No

List current users

Water plant

Washeteria

* BTU/Hr Meter

☒ Yes

☐ No

* Additional Waste Heat Available

☐ No

☒ Yes

List Potential New Users

School

System Information

Supply / Return Delta T

17°F

Estimate of current annual heating fuel gallons displaced

Switchgear metering shows 32.8 billion BTU total, using a value of 140k BTU/gallon for heating oil 23,430 gallons have been displaced. I don't know the date/time when the totalizing meter was reset, it may be since start of the year?

Estimate of potential annual heating fuel gallons displaced

Depending on how the existing heating system is configured in the school, five to seven thousand additional gallons displaced per year would be an easy figure to reach. Much more is likely.

Existing Heat Sales Agreement(s)

Unknown, plant operator wasn't available when I was there; contact the Mayor, Tim Gavin, Jr. @ 907-494-2121?

General Questions

Use separate sheet(s) to answer these questions.

1. If records are available, indicate the number, duration, and causes of all forced outages during the last 12 months. If records are not available, provide whatever reasonable estimates available from utility personnel regarding outages number, duration, and causes.

The plant operator wasn't available when I was in town; I got there late in the day. He said they haven't had many problems in the plant but have had some distribution problems during the construction of the water system in town. Also there is a very large phase imbalance, which has lead to black outs while running the small generator.

ALASKA ENERGY AUTHORITY

VILLAGE POWER SYSTEM INVENTORY

DATE	9/20/12	TIME START	1830	TIME END	2100
COMMUNITY	Buckland	UTILITY	City of Buckland		
OWNERSHIP	City of Buckland	CONTACT	Tim Gavin, Jr.		
OPERATOR	Mike Sheldon @ 494-5018	PHONE	907-494-2121		

	G-1	G-2	G-3	G-4	G-5
ENGINE MAKE	Caterpillar	Caterpillar	Caterpillar		
ENGINE MODEL	3456	3456	C9		
ENGINE RPM	1800	1800	1800		
SERIAL NUMBER	7WG03407	7WG03415	C9J00154		
GOVERNOR TYPE	Cat Electronic	Cat Electronic	Cat Electronic		
MODEL ACTUATOR	--	--	--		
MODEL SPEED CONTROL	--	--	--		
DC VOLTAGE	24VDC	24VDC	24VDC		
UNIT CIRCUIT BREAKER	GE Spectra RMS	GE Spectra RMS	GE Spectra RMS		
TYPE/AMP/VOLT	SSD08B208 800A	SSD08B208 800A	SSD08B208 600A		
CURRENT HOURS	25131	23595	1059		
GENERATOR MAKE	Caterpillar	Caterpillar	Marathon		
GENERATOR MODEL #	LC6	LC6	431PSL6206		
GENERATOR SERIAL #	G6B01040	G6B01044	WA-550735-0506		
GENERATOR CAPACITY (kW)	476	476	200		
GENERATOR VOLTAGE	480	480	480		
VOLTAGE REGULATOR, MAKE & MODEL	Caterpillar CDVR	Caterpillar CDVR	Caterpillar CDVR		
PARALLEL SWITCH GEAR (Y or N)	Yes, automatic	Yes, automatic	Yes, automatic		
kWh METER(Yes or No)	Yes				
POWERHOUSE kWh METER TYPE	Satec				
CATALOG # or TYPE	PM172E-N				
DEMAND ?	200				
CT RATIO	Unkown, 5A secondary				
STATION SERVICE METER (Yes or No)	Yes				
STATION SERVICE METER TYPE	Satec				
CATALOG # or TYPE	PM130E				
BATT. CHARGER/TYPE/MODEL	Charles 93-AA2420HLPR (1ea per generator)				
FUEL DAY TANK TYPE	Double-wall, 100 gallon.				
PUMP #	Oberdorfer FJF				
MOTOR #	Baldor CL3501 1/3HP 1725HP 115/230V				
FUEL DAY TANK METER	Amco 25 USG-RV				
FIRE PROTECTION TYPE/OPERATIONAL?	Several 20lb. ABC extinguishers throughout the plant. 1ea CO2 extinguisher in control room. Fuses were pulled on fire alarm panel. Plant operator wasn't available, no explanation				
ORIGINAL CONTRACTOR	Unknown				
	Plant is new & well maintained. There is a very bad system imbalance. There is also a lot of dirt work going on in the community to put in a new water system, several poles are leaning & anchors pulling because of ground disturbance.				