

**ALASKA ENERGY AUTHORITY
VILLAGE POWER SYSTEM ASSESSMENT**

Community: **Shugnak**
Evaluation Date: **9/19/12** Time Started **1315** Completed **1700**
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	202	350	_____	365	400
Hours of Operation	1,361	5,917	_____	12,362	140

* Generator Condition

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

* BTU/Hr Meter

☐ Yes

☒ No

* Additional Waste Heat Available

☐ No

☒ Yes

List Potential New Users

School

City/IRA Building

System Information

Supply / Return Delta T

The heat recovery module was locked, I had no access

Estimate of current annual heating fuel gallons displaced

Unknown

Estimate of potential annual heating fuel gallons displaced

Unknown

Existing Heat Sales Agreement(s)

Unknown

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 operator left for Kotzebue and no one was around to answer questions. I assume that outages would match Kobuk because they have an intertie. The operator in Kobuk said they had poles go down on the intertie last year/winter but Alaska Line Builders was here this spring and fixed the poles (new guy wires, anchors, new poles, etc.). They still have birds shorting out across phases sometimes; overall the system has been fairly reliable.

ALASKA ENERGY AUTHORITY

VILLAGE POWER SYSTEM INVENTORY

DATE	9/19/12	TIME START	13:15	TIME END	17:00
COMMUNITY	Shugnak	UTILITY	AVEC		
OWNERSHIP	AVEC	CONTACT	Mark Bryan		
OPERATOR	Leslie @ 437-5115	PHONE	565-5316		

	G-1	G-2	G-3	G-4	G-5
ENGINE MAKE	John Deere	Caterpillar		Detroit	Cummins
ENGINE MODEL	6619AF-00	3406B		Series 60	KTA19 G2
ENGINE RPM	1800	1800		1800	Unknown
SERIAL NUMBER	RG6619A048018	2WB10464		06R0275355	Unknown
GOVERNOR TYPE	Mechanical	Mechanical		Electronic	Unknown
MODEL ACTUATOR	AGB-200-A3	AGB-200-A5		DDEC	Unknown
MODEL SPEED CONTROL	GAC ESD5111	GAC ESD5500E		GAC EAM104	GAC ESD5520A
DC VOLTAGE	24VDC	24VDC		24VDC	24VDC
UNIT CIRCUIT BREAKER	GE Molded Case	GE Molded Case		GE Molded Case	GE Molded Case
TYPE/AMP/VOLT	3ph//480V/300A	3ph//480V/400A		3ph//480V/600A	3ph//480V/450A
CURRENT HOURS	1,361	5,917		12,362	140
GENERATOR MAKE	Kato	Kato		Kato	Unknown
GENERATOR MODEL #	155-482361111	268-483361111		268-483361111	Unknown
GENERATOR SERIAL #	88669-1	88667-1		88667-3	Unknown
GENERATOR CAPACITY (kW)	202	350		365	400kW
GENERATOR VOLTAGE	480V	480V		480V	480V
VOLTAGE REGULATOR, MAKE & MODEL	Basler APR 63-5	Basler APR 63-5		Basler APR 63-5	Basler APR 63-5
PARALLEL SWITCH GEAR (Y or N)	Yes, manual	Yes, manual		Yes, manual	Yes, manual
kWh METER(Yes or No)	Yes				
POWERHOUSE kWh METER TYPE	Elster CL20 FM 9S KH 1.8 P/R 24 TA2.5A				
CATALOG # or TYPE	A3TL				
DEMAND ?	265kW				
CT RATIO	Unknown, didn't have correct tools to remove panel covers to access				
STATION SERVICE METER (Yes or No)	Yes				
STATION SERVICE METER TYPE	Elster CL200 FM 16S KH 21.6 P/R 24 TA 30A				
CATALOG # or TYPE	A3TL				
BATT. CHARGER/TYPE/MODEL	Saft SLR 24-40				
FUEL DAY TANK TYPE	Single wall 500 gallon				
PUMP #	Worthington 3GAU				
MOTOR #	1 1/2HP 1750 RPM 115/230V				
FUEL DAY TANK METER	Gasboy				
FIRE PROTECTION TYPE/OPERATIONAL?	Halon & 20lb. ABC extinguishers Halon appears charged				
ORIGINAL CONTRACTOR	Engineered Fire Systems				
	Operator was not in village when I arrived, he went to Kotzebue, no one could tell me who the alternate was. Most of the plant was unlocked except for unit #5 and the heat recovery module.				