

ALASKA ENERGY AUTHORITY
VILLAGE POWER SYSTEM ASSESSMENT

Community: Mountain Village
Evaluation Date: 10/16/12 Time Started 11:15 AM Completed 1:00 PM
Evaluator(s): Brendan Costello

*** 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	300kW	_____	500kW	440kW	750kW
Hours of Operation	<u>51,269</u>	_____	<u>9,162</u>	<u>9,698</u>	<u>313</u>

* 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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" 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

Just the power house buildings

*** BTU/Hr Meter**

☐ Yes

☒ No

*** Additional Waste Heat Available**

☒ No

☐ Yes

List Potential New Users

Unknown excess capacity

System Information

Supply / Return Delta T - - unknown

Estimate of current annual heating fuel gallons displaced - - unknown

Estimate of potential annual heating fuel gallons displaced - - unknown

Existing Heat Sales Agreement(s) - - n/a

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.

ALASKA ENERGY AUTHORITY

VILLAGE POWER SYSTEM INVENTORY

DATE	10/16/12	TIME START	11:15 AM	TIME END	1:00 PM
COMMUNITY	Mountain Village	UTILITY	AVEC		
OWNERSHIP	AVEC	CONTACT	David Peterson		
OPERATOR	David Peterson	PHONE	591-6025		

	G-1	G-2	G-3	G-4	G-5
ENGINE MAKE	Caterpillar		Caterpillar	Caterpillar	DDC - MTU
ENGINE MODEL	1W9612		3456	1W2328	Unknown – no tag
ENGINE RPM	1200		1800	1800	1800
SERIAL NUMBER	81Z01562		7WG00473	38S09422	Unknown – no tag
GOVERNOR TYPE	Woodward		Unknown - unfound	Woodward	Unknown - unfound
MODEL ACTUATOR	D8250-501		-	-	-
MODEL SPEED CONTROL	P/N 8272-288		Unknown - unfound	P/N 8272-288 0	Unknown - unfound
DC VOLTAGE	24		24	24	24
UNIT CIRCUIT BREAKER	GE		GE	GE	GE
TYPE/AMP/VOLT	TKM3F/600A/600V		TKM3F/700A/600V	TKM3F/?A/600V	TKM3F/1000A/600V
CURRENT HOURS	51,269		9,162	9,698	313
GENERATOR MAKE	Kato		Unknown – no tag	Kato	Kohler
GENERATOR MODEL #	300SR9E		Unknown – no tag	500-483361111	750ROZD4
GENERATOR SERIAL #	70847-1		Unknown – no tag	85413	0765433
GENERATOR CAPACITY (kW)	300		500	440	750
GENERATOR VOLTAGE	480		480	480	480
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)	Y		Y	Y	Y
BATT. CHARGER TYPE	Nife		Nife	Nife	Nife
BATT. CHARGER MODEL	SCL-24-15		SCL-24-15	SCL-24-15	SCL-24-15
kWh METER(Yes or No)	Yes				
POWERHOUSE kWh METER TYPE	Elster				
CATALOG # or TYPE	A3TL				
DEMAND ?	400-650 kW				
CT RATIO	unknown				
STATION SERVICE METER (Yes or No)	Yes				
STATION SERVICE METER TYPE	Elster				
CATALOG # or TYPE	A3TL				
FUEL DAY TANK TYPE	60 gal.				
PUMP #	Ingersoll Dresser 3GASM1DO				
MOTOR #	Unknown – no tag				
FUEL DAY TANK METER	GPI MR 5-30				
FIRE PROTECTION	Yes				
TYPE/OPERATIONAL?	Halon, yes				
ORIGINAL CONTRACTOR	unknown				

General Questions and Comments

Operator reports 1-2 power outages/year, but out within distribution.

Operator reports that generator 1 is getting too small to be useful, perhaps only at night in the summer, or to parallel it.

Operator reports that the power generation buildings have minor leaks.

Generators 3 and 5 were observed to have minor oil leaks.

AVEC linemen were in town while survey was being conducted. Some poles were observed to lean > 10 deg. Operator reports pole maintenance to be a struggle due to the presence of permafrost throughout the area.

Operator reports AVEC rebalanced phase loads approx. 2 years ago. Operator logs indicate good balance.