

**ALASKA ENERGY AUTHORITY
VILLAGE POWER SYSTEM ASSESSMENT**

Community: Marshall
Evaluation Date: 10/15/12 Time Started 2:15 PM Completed 3:15 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	500kW	325kW	260kW	_____	_____
Hours of Operation	<u>4,370</u>	<u>51,066</u>	<u>665</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 checked="" type="checkbox"/>	<input checked="" 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 treatment plant _____

* BTU/Hr Meter

☐ Yes

☒ No

* Additional Waste Heat Available

☒ No

☐ Yes

List Potential New Users

Capacity unknown _____

System Information

Supply / Return Delta T - - **30 deg. F**

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.

ALASKA ENERGY AUTHORITY

VILLAGE POWER SYSTEM INVENTORY

DATE	10/15/12	TIME START	2:15 PM	TIME END	3:15 PM
COMMUNITY	Marshall	UTILITY	AVEC		
OWNERSHIP	AVEC	CONTACT	Alan Bolvier		
OPERATOR	Alan Boliver	PHONE	679-2029		

	G-1	G-2	G-3	G-4	G-5
ENGINE MAKE	Caterpillar	Detroit Diesel	Detroit Diesel (Series 60)		
ENGINE MODEL	3456	6063TK35	S60 (Unknown Tag Covered)		
ENGINE RPM	1800	1800	1200		
SERIAL NUMBER	3PG01602	06R0730938	6R122271		
GOVERNOR TYPE	Unknown – not found	GAC	GAC		
MODEL ACTUATOR	-	-	-		
MODEL SPEED CONTROL	Unknown – not found	EAM104	EAM104		
DC VOLTAGE	24	24	24		
UNIT CIRCUIT BREAKER	unknown	unknown	unknown		
TYPE/AMP/VOLT	unknown	unknown	unknown		
CURRENT HOURS	4,370	51,066	665		
GENERATOR MAKE	Caterpillar	Kohler	Kato		
GENERATOR MODEL #	IC6	350REOZD	A258440000		
GENERATOR SERIAL #	G6B00478	0763678	10146-02		
GENERATOR CAPACITY (kW)	500	325	260		
GENERATOR VOLTAGE	480	480	480		
VOLTAGE REGULATOR, MAKE & MODEL	Basler APR 63-5	Basler APR 63-5	Basler APR 63-5		
PARALLEL SWITCH GEAR (Y or N)	Y	Y	y		
BATT. CHARGER TYPE	Saft Nife	Saft Nife	Saft Nife		
BATT. CHARGER MODEL	SCB 102-24-35	SCB 102-24-35	SCB 102-24-35		
kWh METER(Yes or No)	Yes				
POWERHOUSE kWh METER TYPE	Elster				
CATALOG # or TYPE	A3TL				
DEMAND ?	150-350 kW				
CT RATIO	unknown				
STATION SERVICE METER (Yes or No)	yes				
STATION SERVICE METER TYPE	Elster				
CATALOG # or TYPE	A3TL				
FUEL DAY TANK TYPE	250 gal.				
PUMP #	Unknown – no tag				
MOTOR #	Century CS-184-LMD-6-320452-01				
FUEL DAY TANK METER	GPI – MR 5-30				
FIRE PROTECTION	Yes				
TYPE/OPERATIONAL?	Halon, yes				
ORIGINAL CONTRACTOR	unknown				

General Questions and Comments

No governor was found for gen. 1.

Operator reports difficulty in syncing gen. 1.

Operator claims that waste heat recovery is in effect and that the water treatment plant is in the loop, but that the loop is shut off because there was "not enough heat".

Operator reports approx. 2 outages/year, due to "mechanical reasons".

Waste oil was observed in container inside power plant.

Power poles outside showed leaning, with a few perhaps as much as 15 deg. Conductors consequently sagged. One pole was observed with its supporting guy wires pulled completely out of the ground.

Operator reports that permafrost in the area heaves and pushes the poles up and sideways.