

**ALASKA ENERGY AUTHORITY
VILLAGE POWER SYSTEM ASSESSMENT**

Community: Adak
Evaluation Date: July 20, 2012 Time Started 7:00am Completed 9:00pm
Evaluator(s): Tim Gardner

*** 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

Plant is in a poor geographical location, poor winter access.

*** 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)

All exhaust fans have been blown off of the roof

* 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 #6	Unit #2	Unit #3	Unit #4	Unit # 5
kW	500kW	1135kW	800kW	800kW	800kW
Hours of Operation	375	3377	Unknown Destroyed by fire	35427	40155

* Generator Condition

	Unit #6	Unit #2	Unit #3	Unit #4	Unit #5
Good, like new	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor, guards/covers missing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Destroyed by fire		

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 **Distribution is combination of 2400V / 6900V / 13,800V**
- ☐ 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)

Most transformers are leaking oil

*** 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

* BTU/Hr Meter

☐ Yes

☐ No

* Additional Waste Heat Available

☐ No

☐ Yes

List Potential New Users

System Information

Supply / Return Delta T - **N/A**

Estimate of current annual heating fuel gallons displaced

N/A

Estimate of potential annual heating fuel gallons displaced

N/A

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. **Not Available**

Observed issues:

- Several major leaks in roof due to air handlers blown off and shingles missing
- Fuel tanks cannot be filled above 50% due to seem welds leaking
- Fuel plumbing leaking at tanks and day tanks
- All transformers are rotting away
- Several transformers are pole mounts that are on concrete pads
- Most transformers are leaking oil into the dirt
- Over head transmission lines are brittle. Several repairs made with 50' section and insulation falling off.
- There are 3 different distribution voltages: 2400 volt, 6900 volt, and 13,800 volt
- There are three sub stations with switch gear
- Main control panels in switch gear room are non functional due to rats eating the wiring
- There are 5 generators only 3 of them are functional
- 2 3516 are functional with over 30,000 hrs units 4 and 5
- Unit 3 burned to the ground
- Unit 2 (not installed) needs missing parts replaced and generator exciter and rotor replaced
- Unit 6 is a 3456 which will run but does not parallel to units but will carry just housing not cannery
- Roof leaking so bad that it blew up one of the busses it had to be bypassed
- None of the transformers are secure from vandalism
- Power plant is hard to reach during winter, it is unreachable during storms due to its location

Outage Log:

Yearly Totals

Month	Total Minutes for month	Number of Outages for the month	Scheduled Outages Each Month
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January 1, 2011	0	0	0
February 1, 2011	0	0	0
March 1, 2011	540	1	0
April 1, 2011	0	0	0
May 1, 2011	1050	2	1
June 1, 2011	0	0	0
July 1, 2011	505	2	0
August 1, 2011	0	0	0
September 1, 2011	0	0	0
October 1, 2011	15	1	0
November 1, 2011	15	1	0
December 1, 2011	320	3	1

Yearly Totals Hours	40.75
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Total Number of outages for Year	10
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ALASKA ENERGY AUTHORITY

VILLAGE POWER SYSTEM INVENTORY

DATE	July 20, 2012	TIME START	7:00am	TIME END	9:00pm
COMMUNITY	Adak	UTILITY	TDX Power		
OWNERSHIP	TDX Power	CONTACT	Bill Brister 907-947-0401		
OPERATOR	Tina Romberg	PHONE	907-592-2499		

	G-6	G-2	G-3	G-4	G-5
ENGINE MAKE	Caterpillar	Caterpillar	Caterpillar	Caterpillar	Caterpillar
ENGINE MODEL	3406	3512 ST	3516	3516	3516
ENGINE RPM	1800	1800	1200	1200	1200
SERIAL NUMBER	7WG02490	24Z01809	733Z00233	733Z00234	733Z00235
GOVERNOR TYPE	Cat Electronic	Woodward	Woodward	Woodward	Woodward
MODEL ACTUATOR	--	8250-565	UGA40	UGA40	UGA40
MODEL SPEED CONTROL	--	2301A	2301A	2301A	2301A
DC VOLTAGE	24VDC	24VDC	24VDC	24VDC	24VDC
UNIT CIRCUIT BREAKER	Illegible	Illegible	Brown Boveri	Brown Boveri	Brown Boveri
TYPE/AMP/VOLT	Unknown	Unknown	1200A / 2400V	1200A / 2400V	1200A / 2400V
CURRENT HOURS	375	3377	Unknown	35427	40155
GENERATOR MAKE	Caterpillar	Caterpillar	Caterpillar	Caterpillar	Caterpillar
GENERATOR MODEL #	LC6	SR4	A232790001	A232790001	A232790001
GENERATOR SERIAL #	G6B00312	6PA00876	95140-01	95140-02	95140-03
GENERATOR CAPACITY (kW)	500kW	1135kW	800kW	800kW	800kW
GENERATOR VOLTAGE	277/480	277/480	2400V	2400V	2400V
VOLTAGE REGULATOR, MAKE & MODEL	Cat	Cat	Basler SR4	Basler SR4	Basler SR4
PARALLEL SWITCH GEAR (Y or N)	N	Y	Y	Y	Y
kWh METER(Yes or No)	No				
POWERHOUSE kWh METER TYPE	Qty 3 – All Inoperable				
CATALOG # or TYPE					
DEMAND ?					
CT RATIO					
STATION SERVICE METER (Yes or No)	Y				
STATION SERVICE METER TYPE	GE				
CATALOG # or TYPE	Cat# 701X1G2 Type: DS64 Qty: 2				
BATT. CHARGER/TYPE/MODEL	G-6: SENS FCA24-10-2411U / G-2-3-4-5: Schumacher SE-70MA				
FUEL DAY TANK TYPE	Pryco Qty: 3				
PUMP #	Oberdorfer IGD 02275 / N994R				
MOTOR #	Marathon Cat: K022 Mdl: TVM56T17D5309A-L Qty: 2				
FUEL DAY TANK METER	Badger Meter				
FIRE PROTECTION TYPE/OPERATIONAL?	Fire Extinguisher				
ORIGINAL CONTRACTOR	US Army				