

**ALASKA ENERGY AUTHORITY
VILLAGE POWER SYSTEM ASSESSMENT**

Community: Red Devil
Evaluation Date: 10/12/12 Time Started 12:45 PM Completed 2:00PM
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	40kW	50kW	40kW	_____	_____
Hours of Operation	<u>3540</u>	<u>1045</u>	<u>Unknown</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 type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor, guards/covers missing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" 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

*** BTU/Hr Meter**

☐ Yes

☒ No

*** Additional Waste Heat Available**

☒ No

☐ Yes

List Potential New Users

System Information

Supply / Return Delta T

Estimate of current annual heating fuel gallons displaced

Estimate of potential annual heating fuel gallons displaced

Existing Heat Sales Agreement(s)

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	10/12/12	TIME START	12:45 PM	TIME END	2:00 PM
COMMUNITY	Red Devil	UTILITY	MKEC		
OWNERSHIP	MKEC	CONTACT	Ruby Egrass		
OPERATOR	Ruby Egrass	PHONE	447-3246		

	G-1	G-2	G-3	G-4	G-5
ENGINE MAKE	Deutz	Deutz	Deutz		
ENGINE MODEL	D 914 L 04	F6L912GEN	Type: F4L912		
ENGINE RPM	1800	1800	1800		
SERIAL NUMBER	08853233	7124762	unknown		
GOVERNOR TYPE	Woodward	Woodward	Woodward		
MODEL ACTUATOR	APE 35DZ/S/1/E/2	8256-017	8256-017		
MODEL SPEED CONTROL	8290-186	8290-186	unknown		
DC VOLTAGE	12	12	12		
UNIT CIRCUIT BREAKER	Cutler-Hammer	Cutler-Hammer	Cutler-Hammer		
TYPE/AMP/VOLT	EHD/90A/480V	FDB/125A/600V	EHD/60A/480V		
CURRENT HOURS	3,540	1,045	unknown		
GENERATOR MAKE	Stamford	Kato	Kato		
GENERATOR MODEL #	unknown	A228010014	A239170006		
GENERATOR SERIAL #	M11L496520	93067-04	96985-01		
GENERATOR CAPACITY (kW)	40	50	40		
GENERATOR VOLTAGE	480	480	480		
VOLTAGE REGULATOR, MAKE & MODEL	unknown	Basler APR 63-5	unknown		
PARALLEL SWITCH GEAR (Y or N)	N	N	N		
BATT. CHARGER TYPE	La Marche	SENS	SENS		
BATT. CHARGER MODEL	A46-10-12V-A1	FC12-10-2011U	FC12-10-2011U		
kWh METER(Yes or No)	Yes				
POWERHOUSE kWh METER TYPE	ABB				
CATALOG # or TYPE	A1D				
DEMAND ?	20-50 kW				
CT RATIO	200:5				
STATION SERVICE METER (Yes or No)	yes				
STATION SERVICE METER TYPE	Landis and Gyr				
CATALOG # or TYPE	MS				
FUEL DAY TANK TYPE	100 gal.				
PUMP #	Unknown				
MOTOR #	unknown				
FUEL DAY TANK METER	Badger Meter				
FIRE PROTECTION	None				
TYPE/OPERATIONAL?	-				
ORIGINAL CONTRACTOR	unknown				

General Questions and Comments

Operator reports having approx. 3 years experience in role.

Gen. 1 was installed last year, came in used condition. It leaks oil.

Gen. 3 is not functional, and appears to have been a little cannibalized.

Waste oil in buckets onsite. Operator reports that there is a plan to get an incinerator.

There were regular power outages until maintenance that occurred last week.

Overall, the facility and entire generation setup appears to be in terrible shape, complete with copious amounts of oil covering most of the floor, and diesel as well.

Operator reports that approx. 5 years ago there was a major fuel spill onsite. The status of a clean-up is unknown.