

**ALASKA ENERGY AUTHORITY
VILLAGE POWER SYSTEM ASSESSMENT**

Community: Bethel
Evaluation Date: Sept 14-15, 2012 Time Started 1:00p Completed 7:00p
Evaluator(s): Steve Keelan

*** 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	Unit #6
kW	2250kW	2250kW	2250kW	2250kW	2250kW	2250kW
Hours of Operation	227	26234	19854	14132	27273	15911

* Generator Condition

	Unit #1	Unit #2	Unit #3	Unit #4	Unit #5	Unit #6
Good, like new	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input 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"/>	<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

Given to locals

*** 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

State Offices, YKHC Hospital, UAF

* BTU/Hr Meter

☒ Yes

☐ No

* Additional Waste Heat Available

☐ No

☒ Yes

List Potential New Users

YKHC Additional Buildings

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) **SOA, YKHC, UAF**

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**

ALASKA ENERGY AUTHORITY

VILLAGE POWER SYSTEM INVENTORY

DATE	Sept 14-15, 2012	TIME START	1:00p	TIME END	7:00p
COMMUNITY	Bethel	UTILITY	Bethel Utility Co		
OWNERSHIP	Bethel Utility Co	CONTACT	Lenny Walsh		
OPERATOR	Lenny Walsh	PHONE	907-543-2949		

	G-1	G-2	G-3	G-4	G-5
ENGINE MAKE	EMD	EMD	EMD	EMD	EMD
ENGINE MODEL	20-645-E4B	20-645-E4B	20-645-E4B	20-645-E4B	16-645-E4B
ENGINE RPM	900	900	900	900	900
SERIAL NUMBER	76D1-1061	73G1-1019	81D1-1028	76C1-1039	74M1-1069
GOVERNOR TYPE	Woodward	Woodward	Woodward	Woodward	Woodward
MODEL ACTUATOR	EGB13C	EGB13C	EGB13C	EGB13C	EGB13C
MODEL SPEED CONTROL	Groschop	Woodward	Groschop	Groschop	Groschop
DC VOLTAGE	115VAC	24VDC	115VAC	115VAC	115VAC
UNIT CIRCUIT BREAKER	GE	GE	GE	GE	GE
TYPE/AMP/VOLT	FK143/600A/15kV	FK143/600A/15kV	FK143/600A/15kV	FK143/600A/15kV	FK143/600A/15kV
CURRENT HOURS	277	26234	19854	14132	27273
GENERATOR MAKE	GM	No Data Tag	GM	GM	Baylor
GENERATOR MODEL #	A-20-T24	--	A-20-T24	A-20-T24	G855RNV
GENERATOR SERIAL #	7601-1081	--	7601-1042	7601-1029	EW60RN
GENERATOR CAPACITY (kW)	3250kW	3250kW	3250kW	3250kW	2865kW
GENERATOR VOLTAGE	4160	4160	4160	4160	4160
VOLTAGE REGULATOR, MAKE & MODEL	Basler SR4A23083A	Basler SR4A23083A	Basler SR4A23083A	Basler SR4A23083A	Basler SR4A23083A
PARALLEL SWITCH GEAR (Y or N)	Y	Y	Y	Y	Y
kWh METER(Yes or No)	6 meters ; one per gen all identical				
POWERHOUSE kWh METER TYPE	Dial				
CATALOG # or TYPE	B45-2M (6)				
DEMAND ?					
CT RATIO	800:5				
STATION SERVICE METER (Yes or No)	Yes				
STATION SERVICE METER TYPE	Dial				
CATALOG # or TYPE	BM-65-S				
BATT. CHARGER/TYPE/MODEL	No Batt Chargers				
FUEL DAY TANK TYPE	No Day Tank				
PUMP #	--				
MOTOR #	--				
FUEL DAY TANK METER	--				
FIRE PROTECTION	Fire Hose / ABC Extinguishers				
TYPE/OPERATIONAL?					
ORIGINAL CONTRACTOR					

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OWNERSHIP	Bethel Utility Co	CONTACT	Lenny Walsh		
OPERATOR	Lenny Walsh	PHONE	907-543-2949		

G-6

ENGINE MAKE	EMD				
ENGINE MODEL	16-645-E4B				
ENGINE RPM	900				
SERIAL NUMBER	76D1-1018				
GOVERNOR TYPE	Woodward				
MODEL ACTUATOR	EGB13C				
MODEL SPEED CONTROL	Groschop				
DC VOLTAGE	115VAC				
UNIT CIRCUIT BREAKER	GE				
TYPE/AMP/VOLT	FK143/600A/15kV				
CURRENT HOURS	15911				
GENERATOR MAKE	GM				
GENERATOR MODEL #	A-20-T24				
GENERATOR SERIAL #	8437-3				
GENERATOR CAPACITY (kW)	2865kW				
GENERATOR VOLTAGE	4160				
VOLTAGE REGULATOR, MAKE & MODEL	Basler SR4A23083A				
PARALLEL SWITCH GEAR (Y or N)	Y				
kWh METER(Yes or No)	6 meters ; one per gen all identical				
POWERHOUSE kWh METER TYPE	Dial				
CATALOG # or TYPE	B45-2M (6)				
DEMAND ?					
CT RATIO	800:5				
STATION SERVICE METER (Yes or No)	Yes				
STATION SERVICE METER TYPE	Dial				
CATALOG # or TYPE	BM-65-S				
BATT. CHARGER/TYPE/MODEL	No Batt Chargers				
FUEL DAY TANK TYPE	No Day Tank				
PUMP #	--				
MOTOR #	--				
FUEL DAY TANK METER	--				
FIRE PROTECTION TYPE/OPERATIONAL?	Fire Hose / ABC Extinguishers				
ORIGINAL CONTRACTOR					