



CITIZEN TASK FORCE PRESENTATION

SITKA ELECTRIC DEPARTMENT -

- *Distribution*
- *Generation*
- *Transmission*
- *5 Year Plan*
- *Fiscal Challenges - Rates & Revenue*

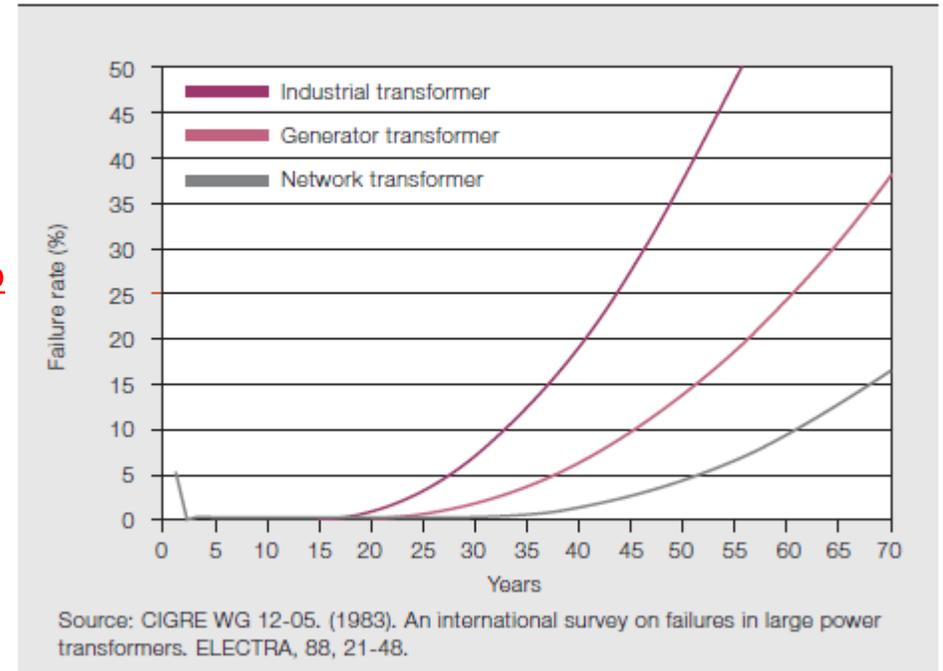




ELECTRIC DEPARTMENT – Key Distribution Challenges

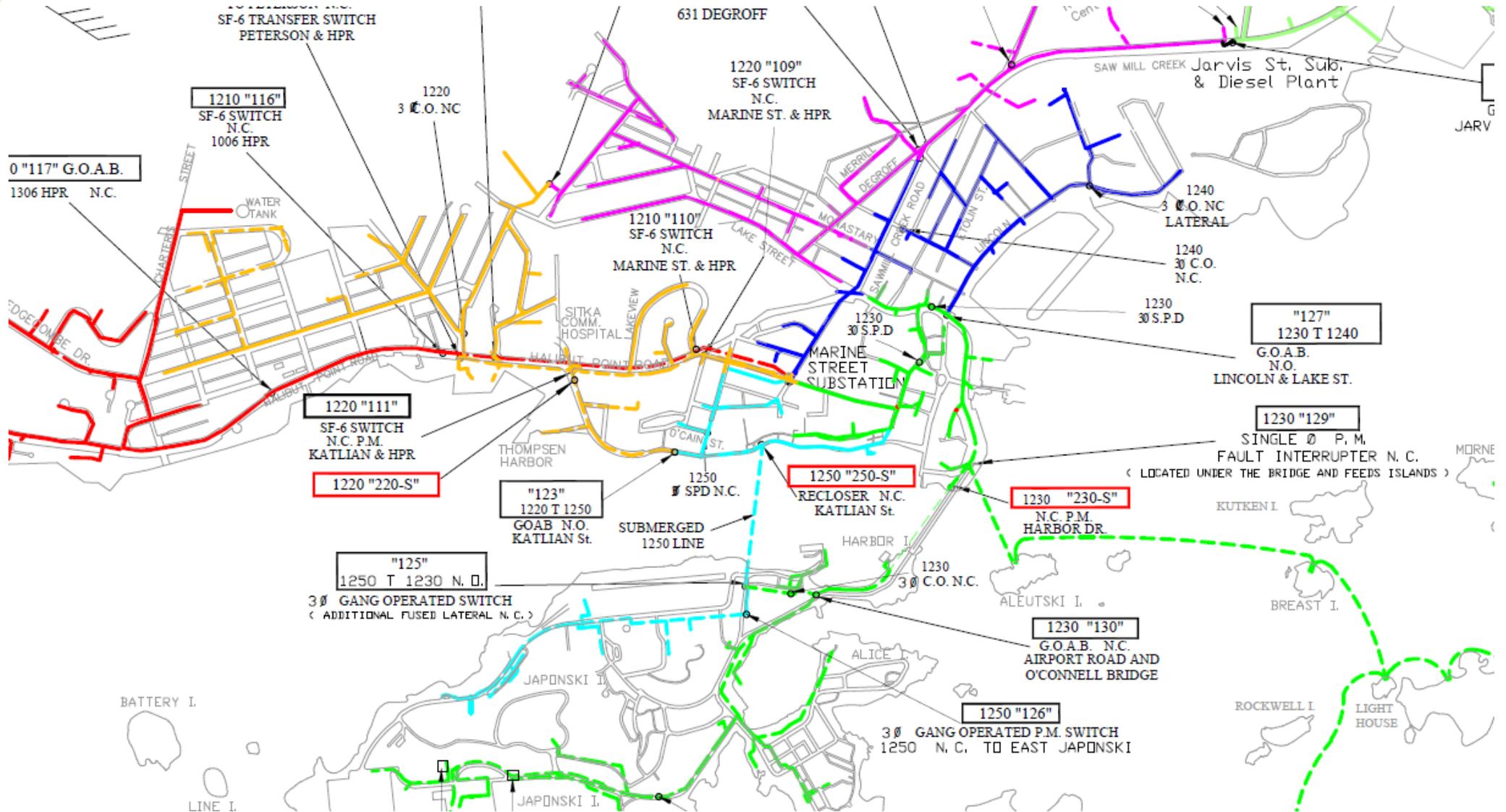
- 3 Substations – Marine Street, Jarvis, Industrial Park (no N-1 Design)
- Marine Street Substation 80% of Sitka Customers
 - 35 year old transformer, 35 year old Spare 1phase, 9-12 mo Lead Time
 - ALTERNATE 1 – Do nothing, outage 3weeks-6months, Costly
 - ALTERNATE 2 – Test 35 year old spare and place in service, plan temp sub
 - ALTERNATE 3 – Buy Spare and hold till failure, 3 week outage
 - ALTERNATE 4 – Buy Spare, Replace after Jarvis Xfrmr upgrade complete
- New Jarvis Substation Transformer
 - Design for Redundancy for Marine Street (N-1)
 - Eliminate growing overload condition at Marine St
 - Would allow for replacement of Marine St Transformer
 - ALTERNATE 1 – Do Nothing, outage 3 weeks – 6 months
 - ALTERNATE 2 – Install new transformer, design for N-1 to avoid need of Spare
- New Kramer Substation Project
 - Capacity on HPR line has grown over time, load on #1210 Feeder too high
 - ALTERNATE 1 – Do Nothing, outage 3weeks to 6 months
 - ALTERNATE 2 – Install new Substation and Transformer, design for some level of N-1 to avoid need of spare

4 Development of the transformer failure rate in three different applications





ELECTRIC DEPARTMENT – Key Distribution Challenges





ELECTRIC DEPARTMENT – Key Generation Challenges

- Fuel Release
 - 200,000 gallon tank and containment last overhaul 15+ years ago. Spill 8/2015
 - ALTERNATE 1 – Remove existing 200,000 gallon tank and containment
 - ALTERNATE 2 – Engineer P&ID's, OPS, ONOPS, Clearance Procedures
 - ALTERNATE 3 – Implement “best practices” by replacing rubber liner with coatings, installing oil water separator sump and alarms, repair existing 200,000 gallon tank and returning system to full service.
- 35 Year Old Green Lake Plant Overhaul
 - Last Overhaul in the 90's
 - ALTERNATE 1 – Do nothing, regular maintenance converting to large scale, expensive, long unplanned failures
 - ALTERNATE 2 – Plan for Inspection in 2017 and Major Overhaul Outage in 2018
- 3 Fairbanks Diesels –
 - 36+ years old
 - Winter Jarvis St capacity without is 14.5mw + 4.5mw = 19 mw (below winter normal capacity)
 - ALTERNATE 1 – Do Nothing, brownouts during normal system failures or transmission line work
 - ALTERNATE 2 – Replace old machines with similar Diesel Generation
 - ALTERNATE 3 – Replace with new technology (Batteries?)
 - ALTERNATE 4 – Mitigate failure risk with additional transmission line (Blue lake to Thimbleberry Trailhead)



ELECTRIC DEPARTMENT – Key Generation Challenges

Facility Location	Type	Unit Rating (MW)	Age	Actual Capability	Avg Weather Annual Energy Generation	Annual Energy Produced (Yr/MWh)				
			(Yrs)	(MW)	(MWh)					
Blue Lake[1]	Hydro	(3) @ 5.3	1	14	94,500	2008/118,596				
Green Lake[2]	Hydro	(2) @ 8.0	35	15	60,000	2009/117,632				
Campground	Hydro	(1) @ 1.5	1	1	8,760	2010/115,163				
Jarvis Plant	Reciprocating Diesel	(1) @ 4.5 (Cat)	14	4.5	As Required	2012/117,851				
Jarvis Plant	Reciprocating Diesel	(3) @ 2.5 (FM)	36+	7.5	As Required	2013/115,763				
Jarvis Plant	Diesel Turbine	(1) @ 15.0 (Titan 130)	1	15	As Required	2014/114,661				
Total				30 (hydro) 27 (diesel)	163,260 (firm[4])	Avg/116,855				
Winter Load - Normal/peak/max cap				20 mw	27 mw	37 mw				
Summer Load - Normal/peak/max cap				10-11 mw	18 mw	28 mw				
[1] FERC Order Amending License #2230-044 issued May 30, 2012 for a term of 30 years										
[2] FERC License # 2818 issued April 5, 1979 for a term of 50 years										
[4] Firm energy is defined as hydro generation that can reasonably expected with normal annual conditions										

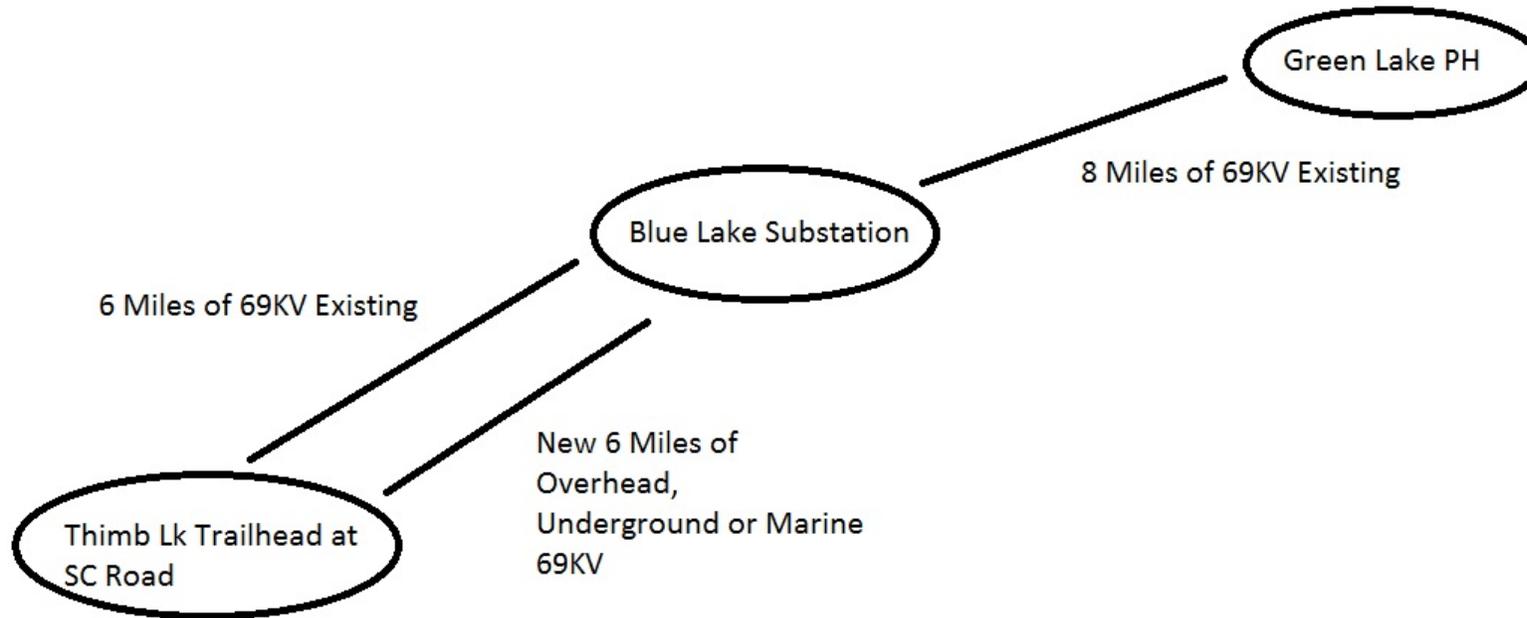


ELECTRIC DEPARTMENT – Key Transmission Challenges

- 69KV Transmission Line from Blue Lake Power House to Thimbleberry Trailhead on SC Road –
 - Steep Grade, Extensive Tree growth close to the line, extensive pole age and damage.
 - Critical line Segment to get both GL Power and BL power to Town
 - ALTERNATE 1 – Do Nothing, brownouts during normal system failures or transmission line work. Potential for 3week outages is High.
 - ALTERNATE 2 – Extensive tree trimming program coupled with complete pole inventory coupled with targeted pole replacement.
 - ALTERNATE 3 – Replace Fairbanks Morse Diesels with similar to offset outage risk
 - ALTERNATE 4 – Mitigate failure risk with additional *overhead* redundant transmission (Blue lake to Thimbleberry Trailhead) . Redundant line would allow for reduced maintenance on existing circuit. Redundant line would reduce fossil fired emissions from Jarvis, could reduce scope of Oil Release best practices (amount of stored fuel)
 - ALTERNATE 5 – Mitigate failure risk with additional *underground* cable redundant transmission (Blue lake to Thimbleberry Trailhead)
 - ALTERNATE 6 – Mitigate failure risk with additional *marine* cable redundant transmission (Blue lake to Thimbleberry Trailhead)
- 69KV Transmission Line from Green Lake Power House to Blue Lake Substation
 - Easier access compared to Blue Lake Segment, Growth rate of trees is high
 - ALTERNATE 1 – Do Nothing, rolling blackouts during normal system failures or transmission line work. Potential for 2-4 day outages is High.
 - ALTERNATE 2 – Extensive tree trimming program coupled with complete pole inventory coupled with targeted pole replacement.



ELECTRIC DEPARTMENT – Key Transmission Challenges





CITIZEN TASK FORCE PRESENTATION

SUMMARY – Potential Risk Mitigation & 5 Year Plan

- *Generation –*
 - I. *Jarvis St Oil Containment \$1.5M, 2016*
 - II. *Green Lake Overhaul \$5M, 2018, Internal Inspection 2017*
- *Distribution –*
 - I. *Jarvis Street Substation Work \$4M, 2016*
 - II. *Marine Street Substation Work = \$4M, 2017*
 - III. *Kramer Lane Substation Construction = \$4M, 2019*
- *Transmission – Alternate 69KV line \$10M, 2018*
- *Rates –*
 - I. *Rate Increase of 2015*
 - II. *Revenue Opportunities*



CITIZEN TASK FORCE PRESENTATION

FISCAL CHALLENGES

- *Total Needed FY16-FY20 - \$28.5M*
 - A. *Total Available Working Capital - \$15.3M*
 - a. *Unspent Bond Proceeds -\$9.5M*
 - b. *Undesignated Fund Balance - \$8.5M*
 - B. *Projected Additional Working Capital FY16-FY19 - \$1.3M*
 - C. *Alternatives/Choices??*



CITIZEN TASK FORCE PRESENTATION

FISCAL CHALLENGES

- *Spend remaining bond proceeds on the most critical items ...but it is not enough*
 - A. *Oil Containment*
 - B. *Jarvis Street Substation*
 - C. *Marine Street Substation*
- *Dip into undesignated fund balance?*
- *Only raise rates to meet minimum 1.25% bonding covenant*
 - A. *Live with working capital inflow*
 - B. *Risk outages*
- *Let it Break, then appeal to the State for help (not realistic)*



DISCUSSION