



Combustion Turbine

CT1 – Lodi / Alameda

Long Range Goals

Purpose

- Establish long range goals and visions for CT1 project for NCPA to use as a guide for decisions and recommendations regarding projects and expenditures for the CT1 Project.



Current Status

- Turbine / Generator
 - Equipment is good
 - Many contractors to choose from for service
 - Parts are available new / refurbished
- Diesel Starter / Gearbox
 - No maintenance issues
 - Not defined overhaul / life
- Balance of Plant
 - No concerns
- Electrical
 - Area of most concern
 - Foreign equipment not common in US
 - Reliability is a concern

Options

- Option 1- Continued Operations for 20 years
 - Most expensive, upfront
 - Provides reliability
- Option 2-Operate to 2025 with option to continue for another 10 years
 - Saves on cost, upfront, but is more if ops continues
 - Limited projects/upgrades
 - May have to accept certain reliability hiccups
- Option 3- Retirement 2025
 - Lowest cost
 - Limited projects/upgrades
 - May result in failure of equipment prematurely
 - May have to accept certain reliability hiccups

Option 1 Project Details

Maintain for 20 Year Operation

	FY2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	
PROJECTS													
Replace U-Type Bushings			245,000										
MCC Upgrade Study					50,000								
Gas Pipeline Coating Repairs							100,000						100,000
Ground Grid Mods - Turner Vehicles				40,000									
Generator Circuit Breaker Upgrade				100,000	100,000	100,000							
Excitation System Upgrade				500,000									
Fire System Upgrade					230,000		230,000						
Gas Line e-Stop				50,000	50,000								
MCC Upgrade						150,000	150,000	150,000					
Switchyard Relay Upgrades						100,000							
TOTAL PROJECTS	0	0	245,000	690,000	430,000	350,000	480,000	150,000	0	0	0	100,000	2,445,000
MAINTENANCE SPENDING													
Annual Outage, Routine Maint			70,000	90,000	185,000	0	68,000	40,000	95,000	45,000	180,000	143,000	
Turner CT and Gen Maint			0	0	0	250,000	0	0	0	0	900,000	350,000	
ALA1 CT and Gen Maint			0	0	225,000	0	0	0	375,000	3,000	350,000	0	
ALA2 CT and Gen Maint			0	0	1,125,000	0	0	0	375,000	0	75,000	0	
TOTAL MAINTENANCE	1,082,600	1,074,200	70,000	90,000	1,535,000	250,000	68,000	40,000	845,000	48,000	1,505,000	493,000	7,100,800
TOTAL PROJECT AND MAINTENANCE	1,082,600	1,074,200	315,000	780,000	1,965,000	600,000	548,000	190,000	845,000	48,000	1,505,000	593,000	9,545,800
Plan For 2015	1,070,000	1,210,000	915,000	190,000	550,000	630,000	400,000	0	545,000	315,000	1,505,000	493,000	7,823,000

Option 2 Project Details

Operate to 2025 with option to continue for another 10 years

	FY2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	
PROJECTS													
Replace U-Type Bushings			245,000										
MCC Upgrade Study												0	
Gas Pipeline Coating Repairs							100,000					100,000	
Ground Grid Mods - Turner Vehicles				40,000									
Generator Circuit Breaker Upgrade												450,000	
Excitation System Upgrade												585,830	
Fire System Upgrade					230,000		230,000						
Gas Line e-Stop				50,000	50,000								
MCC Upgrade												500,000	
Switchyard Relay Upgrades												175,000	
TOTAL PROJECTS	0	0	245,000	90,000	280,000	0	330,000	0	0	0	0	1,810,830	2,755,830
MAINTENANCE SPENDING													
Annual Outage, Routine Maint			70,000	40,000	10,000	125,000	223,000	0	10,000	0	10,000	648,000	
Turner CT and Gen Maint			0	0	0	75,000	75,000	0	0	0	0	1,250,000	
ALA1 CT and Gen Maint			0	0	0	75,000	75,000	0	0	0	0	1,250,000	
ALA2 CT and Gen Maint			0	0	0	1,125,000	0	0	0	0	0	450,000	
TOTAL MAINTENANCE	1,082,600	1,074,200	70,000	40,000	10,000	1,400,000	373,000	0	10,000	0	10,000	3,598,000	7,667,800
TOTAL PROJECT AND MAINTENANCE	1,082,600	1,074,200	315,000	130,000	290,000	1,400,000	703,000	0	10,000	0	10,000	5,408,830	10,423,630
Plan For 2015	1,070,000	1,210,000	915,000	190,000	550,000	630,000	400,000	0	545,000	315,000	1,505,000	493,000	7,823,000

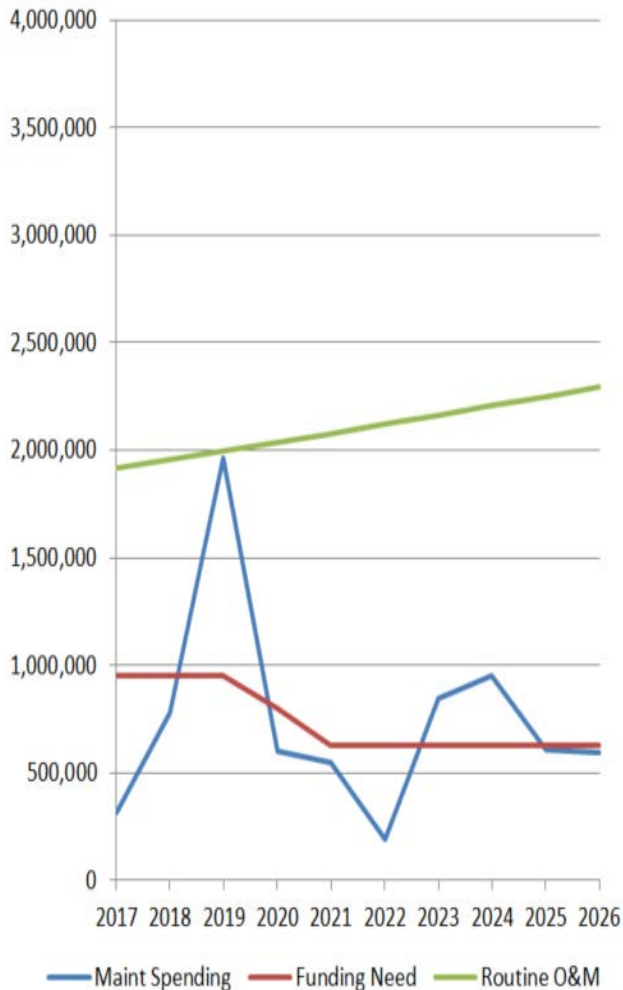
Option 3 Project Details

Retire the Units in 2025

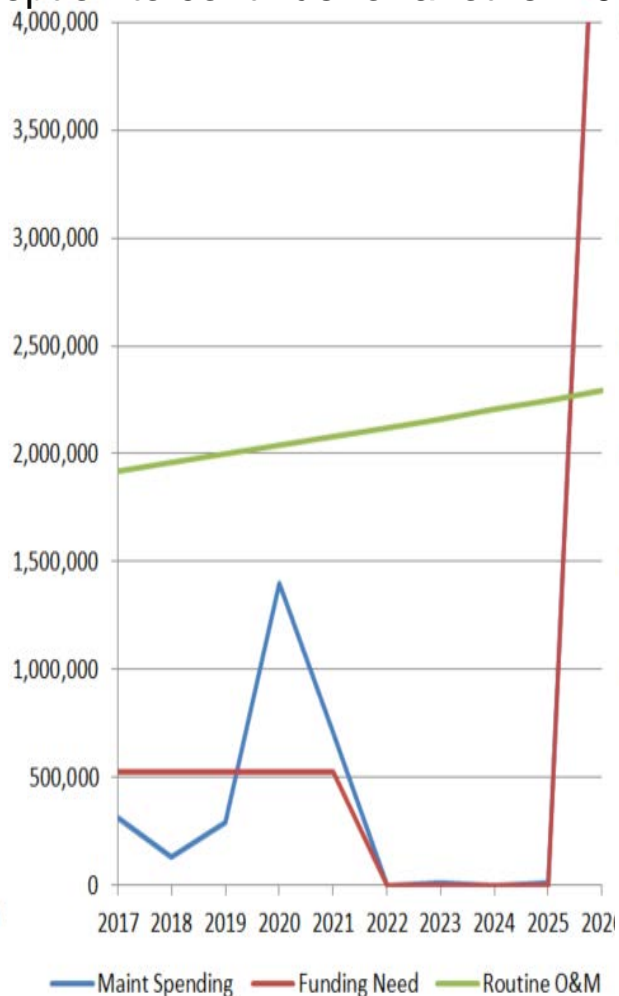
	FY2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	
PROJECTS													
Replace U-Type Bushings			245,000										
MCC Upgrade Study													
Gas Pipeline Coating Repairs							100,000						
Ground Grid Mods - Turner Vehicles				40,000									
Generator Circuit Breaker Upgrade													
Excitation System Upgrade													
Fire System Upgrade					230,000		230,000						
Gas Line e-Stop				50,000	50,000								
MCC Upgrade													
Switchyard Relay Upgrades													
TOTAL PROJECTS	0	0	245,000	90,000	280,000	0	330,000	0	0	0	0	0	945,000
MAINTENANCE SPENDING													
Annual Outage, Routine Maint			50,000	90,000	60,000	0	223,000	0	10,000	0	10,000	0	
Turner CT and Gen Maint			0	0	0	75,000	75,000	0	0	0	0	0	
ALA1 CT and Gen Maint			0	0	75,000	75,000	0	0	0	0	0	0	
ALA2 CT and Gen Maint			0	0	150,000	0	0	0	0	0	0	0	
TOTAL MAINTENANCE	1,082,600	1,074,200	50,000	90,000	285,000	150,000	298,000	0	10,000	0	10,000	0	3,049,800
TOTAL PROJECT AND MAINTENANCE	1,082,600	1,074,200	295,000	180,000	565,000	150,000	628,000	0	10,000	0	10,000	0	3,994,800
Plan For 2015	1,070,000	1,210,000	915,000	190,000	550,000	630,000	400,000	0	545,000	315,000	1,505,000	493,000	7,823,000

Project / Maintenance Spending

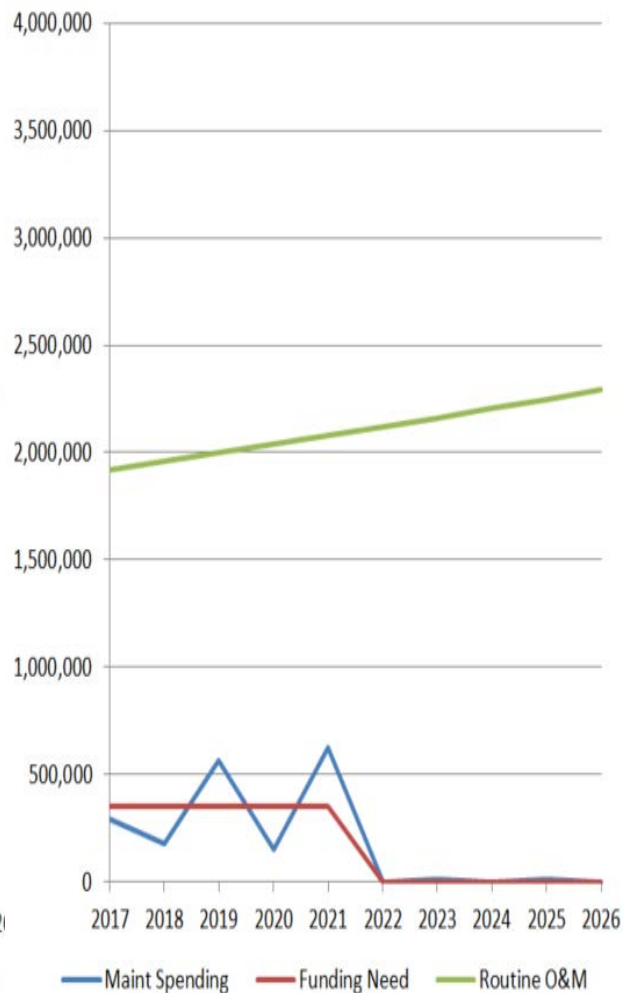
Option 1-Maintain 20 Years



Option 2-Operate to 2025 with option to continue for another 10 yrs



Option 3-Retire Unit in 2025



Project / Maintenance Spending

Maintain for 20 Year Operation											
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Spending		315,000	780,000	1,965,000	600,000	548,000	190,000	845,000	948,000	605,000	593,000
Funding		950,000	950,000	950,000	800,000	625,000	625,000	625,000	625,000	625,000	625,000
Balance	250,000	885,000	1,055,000	40,000	240,000	317,000	752,000	532,000	209,000	229,000	261,000

Operate to 2025 with option to continue for another 10 years											
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Spending		315,000	130,000	290,000	1,400,000	703,000	0	10,000	0	10,000	5,408,830
Funding		525,000	525,000	525,000	525,000	525,000	0	0	0	0	5,408,830
Balance	250,000	460,000	855,000	1,090,000	215,000	37,000	37,000	27,000	27,000	17,000	17,000

Retire the Units in 2025											
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Spending		295,000	180,000	565,000	150,000	628,000	0	10,000	0	10,000	0
Funding		350,000	350,000	350,000	350,000	350,000	0	0	0	0	0
Balance	250,000	305,000	475,000	260,000	460,000	182,000	182,000	172,000	172,000	162,000	162,000

Considerations

- Capacity Value Today \$30/KW-Yr
 - \$2,250,000 value for CT1
 - Hedge value--~ 26% premium (\$37.80/KW-Yr, \$2,835,000)
- Cost of Capacity if built new
 - \$104/KW-Yr
- Value of the projects being behind the meter
 - Does either provide critical constraint relief to interconnecting utility?

Project Evaluation

	Current Rates \$30/KW-Yr	Long Term Contract \$37.80/KW-Yr	New Construction \$104/KW-Yr
Option 1 Continued O&M	(\$3,731,083)	\$786,132	\$39,124,546
Option 2 Plan to Retire, then catch up.	(\$183,888)	\$4,333,327	\$42,671,741
Option 3 Retire in 2025	(\$5,499,737)	(\$982,522)	\$37,355,892
Option 4 New Construction	(\$54,037,385)	(\$49,128,839)	(\$7,469,128)

\$36.44, CT1 is even.

- NPV of options at 5% cost of money
- Option 2 would required \$5.4mm of catch up projects if continued operation is desirable