



Generation Directorate

Current Status of PREPA Generation Fleet

REV: NOV 2, 2021

Power Station	Unit	Capacity (MW)	Available Capacity	Condition	Date of last major maintenance	Date of last major maintenance	Person in charge of attending findings	NME (Million)	FY22	FY23	Currents Status / Action Plan / Comments	
PREPA's Base Generation												
San Juan	CT 5	160	150	Available			Eng. Alejandro Castillo / Plant Manager	\$40.00	\$40.00		Major overhaul; Proposed dates: January 15, 2022; taking moderate risks. Approximate cost \$40 million including LTSA (Long Term Services Agreement).	
	STM 5	60	50	Available		Apr-11					Major overhaul; Proposed dates: January 15, 2022. Verifying delivery of steam turbine parts is a critical path.	
	CT 6	160	120	Available							Major overhaul; Proposed date: February 2023; Approximate cost \$30 million.	
	STM 6	60	0	Not Available	Sep-13	Jun-10			\$33.00		\$33.00	Generator Instrumentation Problems (field Ground) . Forecast November 4 . Major overhaul; Proposed date: February 2023.
	7	100	70	Available	Aug-08	Aug-08			\$18.00		\$18.00	Unit Return to service on October 19, 2021. Turbine rotors have expired hours for major repair (over 70K hours). Approximate repair cost \$5 millions. Boilers Repairs (10 million) needed. Major inspection date to be determined. Unit in limited use (8%) according to EPA MATS (Mercury and Air Toxic Standards).
	8	100	0	Not available	Nov-10	Nov-10			\$18.00		\$18.00	Boiler pipe breakage problems, steam leaks and feedwater heater #6 problems. Limited use unit (8%) according to EPA (MATS). Boiler air leaks. Approximate cost of boiler repairs and auxiliary equipment, \$18 million including new boiler piping.
	9	100	0	Not Available	Nov-19	Aug-12			\$2.00		\$2.00	Programmed outage 7 days (28/oct-3 nov):coolers replacement, BFP9-1 and 9-2 inspection, condenser cleaner etc.DEMI (DeminerIALIZED) water production problems. Temporary water production plant of the Central (RO) faces operational problems. In the process of completing the installation of a new permanent DEMI plant.
	10	100	0	Not available	Sep-09	Sep-09		\$17.00	\$17.00		Low pressure turbine fault. Unit not available since the end of 2015. Returning the unit to service entails an approximate investment of \$16 million and an estimated duration of the works, 6 months.	
Palo Seco	1	85	0	Not available	Apr-08	Apr-08	Eng. Antonio Kalil / Plant Manager	\$10.00		\$10.00	Limited use unit EPA (MATS). Boiler air leaks, requires replacement of boiler piping. Generator has major stator failure and requires turbine work.	
	2	85	0	Not available					\$15.00		\$15.00	Limited used unit EPA (MATS). Faulty unit generator; The unit's Main Power Transformer is used as an output transformer for new MPA FT-8.
	3	216	0	Not Available	Nov-09	Nov-09			\$7.00		\$7.00	Forced Outage 31 Oct --2 Nov: Economizer (boiler) tube failure . Unit return online for November 2 2021. It is required to purchase boiler tube and economizer panels for approximately \$5 million and repair auxiliary equipments, for fiscal year 2022-2023. Unit out of service; boilers tubes failure, return to service november 2 2021.
	4	216	140	Available	May-09	Jun-19			\$3.00	\$3.00		Unit online. Forced outage last month due to oil leak through control wiring. High pressure differential on the air preheaters. Unit return to service on Sunday, October 10, 2021. Environmental outage rescheduled for December 2021, after Costa Sur 6 return to service. Work will be carried out on the boiler and replacement of the air pre-heater baskets.
Aguirre Steam Plant	1	450	375	Available	Feb-12	Dec-08	Eng. Alexis Cruz / Plant Manager	\$20.70	\$19.00	\$1.70	Boiler air in leakages. Major repair rescheduled for January 2022, after the entry of Costa Sur 6. Major works, environmental outages, boiler work and replacement of turbine rotors for an approximate \$18 millions.	
	2	450	375	Available	Mar-10	Dec-19			\$2.35		\$2.35	Unit return online october 27 -2021; programmed outage to correct Feed water control valve issues. In addition, correct boiler air in leakages and air preheaters cleaning. This action eliminated actual limitation. Unit outage beginning on October 11 until october 27 2021. Beginnig the procurement process to repair the Excitation System next year.
Costa Sur	5	410	410	Available	Jul-13	Jul-13	Eng. Miguel Beauchamp/ Plant Manager	\$20.80	\$1.80	\$19.00	Main steam piping failure on September 13, 2021. Unit return service on Wednesday, October 6, 2021. Major outage (boiler, environmental maintenance and replacement of turbine rotors) scheduled for October 2022. Approximate cost \$15 million.	
	6	410	0	Not available	Sep-12	Feb-21			\$6.70	\$5.00	\$1.70	Low pressure turbine failure (LP turbine failure) after major unit repair including these rotors for \$20 million. Rotors were shipped to the US workshop by ship during the week of September 20-27. Findings report is expected for October 18, 2021. Unit expected delivery unit January 15, 2022 at an approximate cost of replacement of damaged parts of \$5 million.
Total PREPA Base Generation		3162	1690	53.45%				\$213.55	\$85.80	\$127.75	Available	



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PREPA's Reserve Generation Fleet											
Aguirre Combined Cycle	I-1	50	48	Available CC		(4,000)	Eng. Harry Velázquez / Plant Manager	\$1.00	\$1.00		Hot gas path inspection \$1M, April 2022.
	I-2	50	48	Available SC		(2,841)		\$1.00	\$1.00		Inlet filters Clogged. Hot gas path inspection scheduled for June 2022.
	I-3	50	50	Available		(11,392)		\$2.50	\$2.50		Major inspection scheduled for January 2022. \$2.5M
	I-4	50	0	Not Available		(1,574)		\$2.00		\$2.00	PT Repair ; Minor outage october 20 -return unit online for nov 5
	ST-1	96	0	Not Available				\$1.00		\$1.00	unit off line october 19; water line repair to cooling tower ; Condenser fouling and air in leakages.
	II-1	50		Not available				\$2.00		\$2.00	MPT 2-1, 2-2 failure.
	II-2	50		Not available				\$2.00		\$2.00	MPT 2-1, 2-2 failure. Start up tests.
	II-3	50	30	Available		(1,307)		\$1.00		\$1.00	Repair coolers fan radiators
	II-4	50		Not available		(3,637)		\$1.70		\$1.70	Stand by Transformer fail. Hot gas path inspection and spare rotor \$1.7M.
ST-2	96		Not available			\$2.00		\$2.00	MPT 2-1, 2-2 failure. Start up tests.		
Total Aguirre CC		592	176	29.73%				\$16.20	\$4.50	\$11.70	Availability
DAGUAO	1-1	21	19	Available			Eng. José Vázquez HG Head Division / Eng. José Pagán Operation Manager	\$2.00	\$2.00		Mayor Outage Repair
	1-2	21	17	Available				\$2.00	\$2.00		Mayor Outage Repair
AGUIRRE	2-1	21		Not available				\$4.00		\$4.00	Unit requires major turbine repair and a complete generator assembly.
	2-2	21	20	Available				\$2.00	\$2.00		Mayor Outage Repair
PALO SECO	1-1	21	18	Available				\$2.00	\$2.00		Mayor Outage Repair
	1-2	21		Not available				\$2.30		\$2.30	Mayor Outage Repair and Generator breaker replacement
	2-1	21	0	Not Available				\$2.00	\$2.00		Mayor Outage Repair
	MPA 1	23		Not available				\$0.10	\$0.10		Environmental air permit. Contract awarded to perform environmental acceptance tests. Waiting for EPA approval of emission testing.
	MPA 2	23		Not available				\$0.10	\$0.10		Environmental air permit. Contract awarded to perform environmental acceptance tests. Waiting for EPA approval of emission testing.
	MPA 3	23		Not available				\$0.10	\$0.10		Environmental air permit. Contract awarded to perform environmental acceptance tests. Waiting for EPA approval of emission testing.
COSTA SUR	1-1	21		Not available				\$2.00	\$2.00		Unit reached full speed not load with excitation. Phasing tests schedule for October 17. Mayor Outage Repair
	1-2	21		Not available				\$4.00		\$4.00	Turbocompressor replacement. Mayor Outage Repair
JOBOS	1-1	21	20	Available				\$2.00	\$2.00		Mayor Outage Repair
	1-2	21	20	Available				\$2.00	\$2.00		Due for major inspection (August 2020) and speed reduction gearbox replacement.
YABUCOA	1-1	21		Not available				\$2.00	\$2.00		Alignment process. Startup testing scheduled for October 8.
	1-2	21	18	Available				\$2.00	\$2.00		Alignment process. Startup testing scheduled for October 22.
VEGA BAJA	1-1	21		Not available				\$2.10	\$2.10		Voltage regulator repair unit expected in service on October 15, 2021
	1-2	21		Not available				\$4.00		\$4.00	Turbocompressor major failure.
Total 18 Peaking Units		384	132	34.38%				\$36.70	\$22.40	\$14.30	Availability
MAYAGÜEZ	1A	27.5		Not available			Eng. José Vázquez / Eng. Waldo Córdoba Plant Manager	\$18.00	\$18.00		Gas generator and power turbine (1B) in critical condition. Repair Cost estimate \$18 million for both units 1A an 1B
	1B	27.5		Not available							
	2A	27.5	27.5	Available							
	2B	27.5	27.5	Available							
	3A	27.5	25.5	Available							
	3B	27.5	25.5	Available							
	4A	27.5		Not available				\$0.80	\$0.80		Combustor casing crack failure. First stage nozzle issues. Pending proposal evaluation. Repair cost Estimate \$800K.
4B	27.5	25	Available								
Total Mayagüez		220	131					\$18.80	\$18.80	\$0.00	
CAMBALACHE	1	82.5		Not available			Eng. Herminio Arroyo / Plant Manager	\$18.00	\$18.00		Unit out of service since 2011; Combustion turbine failure; Proposal \$18 million and six months.
	2	82.5	78	Available				\$6.90	\$6.90		LTSA with GE ; New Automatic Voltaje Regulator; Control System and Maintenance Services HTS
	3	82.5	77	Available				\$6.90	\$6.90		LTSA with GE ; New Automatic Voltaje Regulator; Control System and Maintenance Services HTS
Total Cambalache		247.5	155					\$31.80	\$31.80	\$0.00	



Puerto Rico
Electric Power
Authority

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VIEQUES	1	3	3	Available			Eng. José Vázquez / Eng. Waldo Córdoba Plant Manager					
	2	3	0	Not available								Troubleshooting control system issues.
Culebra	1	2	2	Available								
	2	2	2	Available								
	3	2	2	Available								
Total Vieques and Culebra		12	9									
Total Peaking & Emergency Units		1,455.5	603.0	41.43%				\$103.50	\$77.50	\$26.00	Availability	

HYDROELECTRICS

Toro Negro	1-1	1.5	1.5	Available			Eng. José Vázquez / Head Division					
Toro Negro	1-2	1.5	1.5	Available								
Toro Negro	1-3	1.5	1.5	Available								
Toro Negro	1-4	4.5	0	Not Available								
Toro Negro	2	2		Not Available								Turbine inlet main valve replacement. Phasing test pending.
Yauco	1	25		Not Available				\$8.00	\$4.00	\$4.00		Pending turbine and generator major overhaul. Federal restoration funding allocation for \$8M.
Yauco	2-1	4.5	4.5	Available								Limited pending relay protection system modifications.
Yauco	2-2	4.5	4.3	Available								
Garzas	1-1	3.6	4	Available								
Garzas	1-2	3.6		Not Available								Generator bearing repair. Expected in-service on October 2021.
Garzas	2	5		Not Available								Transmission line failure due to Hurricane Maria. Federal restoration funding approved.
Caonillas	1-1	9		Not Available				\$5.00	\$1.00	\$4.00		Station flooding failure due to Hurricane Maria. In preparation of specifications and bid process documents. Federal restoration funding allocation for \$5M.
Caonillas	1-2	9		Not Available								Pending major restoration budget approvals.
Caonillas	2	3.6		Not Available								Restored generator in coordination for transportation to site.
Dos Bocas	1	5		Not Available								
Dos Bocas	2	5	5	Available								
Dos Bocas	3	5	0	Not Available								
Patillas	1-1	0.8		Not Available								Downstream flow risk concerns.
Patillas	1-2	0.6		Not Available								Downstream flow risk concerns.
Río Blanco	1	2.5		Not Available								Penstock major failure. Federal restoration funding approved.
Río Blanco	2	2.5		Not Available							Penstock major failure. Federal restoration funding approved.	
Total Hydro		100.2	22.3	22.26%				\$13.00	\$5.00	\$8.00		

Total NME (Necessary Maintenance Expenses)								\$330.05	\$168.30	\$161.75	
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