

PG&E Power Generation - Generator



Asset Management Program

Hydro Program – 68 Power houses,
107 Generators (1905 – 1993)

- Two tier program for generator classification – 11kV+, Low Voltage
- Additional requirements for NERC Units (37 machines)
- Asset Programs – Generator, Rotor, Exciter, Governor, Arc Flash

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Asset Management Program

Generator Program – Planned Stator Rewinds

- Affect only 11kV+
- Ranking based on PD testing analysis and visual inspection
- Bundled purchase approach for rewinds
- Stator Core base life ~70 years – evaluate with rewind
- Protection upgrade included

File Home Insert Page Layout Formulas Data Review View

Normal Page Layout Page Break Preview Custom Views Full Screen

Workbook Views

Ruler Formula Bar

Gridlines Headings

Show

Zoom 100% Zoom to Selection

Zoom

New Window Arrange All Freeze Panes

Split Hide Unhide

View Side by Side Synchronous Scrolling Reset Window Position

Window

T23

	A	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
		PDA				Stator Winding			History				Winding	Score		
	Powerhouse	Loose	Trend	Turn-Turn	NQN Max	QM Max	Manf	Age	Cleanliness	Coils Cuto	Coils Repa	Gradient	Rewedge	HiPot	Inspection	
5																
6																
7																
8	Pit 4	5	8	6	7	4	8	6	7	0	0	4	0	2		243
9	Electra	3	5	6	9	9	2	6	8	0	0	8	0			196
10	Pit 5	8	5	5	7	5	2	10	7	0	0	0	0	7		188
11	Balch	5	5	5	10	10	2	3	8	0	0	0	0			178
12	Pit 3	4	4	4	3	3	6	10	7	0	0	0	0	2		172
13	Pit 7	3	5	3	6	4	2	7	8	0	0	5	0	5		170
14	Tiger	3	6	3	3	2	2	6	10	0	3	0	0			166
15	Electra	3	6	3	8	6	2	6	7	0	0	0	0			151
16	Pit 1	2	2	2	1	1	2	5	10	0	0	0	0	10		141
17	Tiger	3	4	3	3	5	2	5	10	0	0	3	0			138
18	Pit 1	2	2	2	1	1	8	7	10	0	0	4	0	2		116
19	Belden	2	3	3	2	2	2	6	10	0	0	0	0	2		108
20	Bucks Creek															0
21	Bucks Creek															0
22	Drum	0	0	0	0	0	2	10	10	0	0	0	0	7		71

23

24

25 How Scores are established):

	Excellent	Weighting	Notes
26			
27	Thermal:	1-2	5 PDA at 45 & 225 degrees
28	End Turn Discharge	1-2	3 PDA aligns between phases
29	Loose	1-2	3 Pos Predom; Load related
30	Trending Up	1-2	10 PDA increasing; serious if doubles in 6 months
31	Turn-Turn	1-2	3 PDA at 225 higher than 45 degrees
32	NQN Max	1-2	1 High count (>600 Flagged; >400 Poor; >200 Good; >100 Excellent)

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Rotor Program – Mechanical & Electrical Assessment

- Electrical refurbishment by pole ground wall or turn to turn insulation replacement
- Need determined by periodic testing (megger, pole drop, rotor impedance)
- Off cycle from stator rewinds

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Exciter and Governor Programs

- Exciters are generally full or pilot replacements
- Governors are principally controls (converting mechanical to electrical)
- Greatest difficulty lies in identifying local load impact and evolving criteria

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Asset Management Program

Arc Flash Program – Engineering Controls

- Remediation for high hazards
- New tools for safe work (clothing, remote racking, PT secondary isolation points)

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Questions?