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## **Lodi Energy Center Project Participant Committee Operational Report**

**Agenda Item No.: 3**

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**Date:** 03/13/2017

**To:** Lodi Energy Center Project Participant Committee

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### **Safety**

- OSHA Recordable: 0 Accidents

### **Notice of Violations**

- Permits: 0 Violations
- NERC/WECC: 0 Violations

### **Outage Summaries:**

- No Forced Outage

### **Planned Outage Summaries:**

- 2017 May: Steam Turbine Limited Overhaul has been deferred (Steam Turbine Bearing Inspection, Steam Turbine Valve Inspection, Alignments, etc.). Outage will center around HRSG and valve maintenance

**Generating Unit Statistics:**

LEC

**Report****Date:**

Start Date 2/1/2017

End Date 3/1/2017

1. Monthly Production 15,337 MWH
2. Productivity Factor
- a. Service Hours 73 Hours
- b. Service Factor 10.8 %
- c. Capacity Factor @ 280MW Pmax 8.2 %
- d. Capacity Factor @ 302MW Pmax 7.6 %
3. Equivalent Operating Availability (EOA) 99.6 %
4. Forced Outage Rate (FOR)
- a. Combustion Turbine Generator 4.0 %
- b. Steam Turbine Generator 4.0 %
5. Heat Rate Deviation
- a. Fuel Cost (Not Current Market Price) 4.00 \$/mmBTU

MW Range	PMOA HR BTU/kW- Hr	Average HR BTU/kW- Hr	Deviation %	Production MWH	Cost \$
Seg. 1 296 +	6850	6,931	1.19%	2,505	\$816
Seg. 2 284 - 296	6870	6,991	1.77%	604	\$293
Seg. 3 275 - 284	6971	6,972	0.02%	1,070	\$5
Seg. 4 250 - 275	7081	7,024	-0.80%	2,471	-\$559
Seg. 5 225 - 250	7130	7,093	-0.52%	1,874	-\$277
Seg. 6 200 - 225	7200	7,221	0.29%	968	\$80
Seg. 7 175 - 225	7450	7,520	0.94%	2,790	\$780
Seg. 8 165 - 175	7760	7,808	0.62%	2,362	\$454
	7,164	7,195	0.33%	14,644	\$1,592

## 6. AGC Control Deviation

MW Range	High Dev MWH	Low Dev MWH	Total Dev MWH	Cost \$
Seg. 1 296 +	1	-1	2	\$52
Seg. 2 284 - 296	2	0	3	\$70
Seg. 3 275 - 284	4	0	4	\$120
Seg. 4 250 - 275	10	-2	12	\$336
Seg. 5 225 - 250	9	-4	13	\$372
Seg. 6 200 - 225	5	-12	17	\$482
Seg. 7 175 - 225	24	-23	47	\$1,414
Seg. 8 165 - 175	8	-2	10	\$305
	62	-45	107	\$3,151

## 7. Starting Reliability

Start Type	Hot Starts	Warm Starts	Cold Starts
Number of Starts	0	1	2
Start Time Benchmark (Minutes)	75	110	200
Start Time Actual (Average Minute)	0.0	368.0	176.0
Start Time Deviation (%)	-100.0%	234.5%	-12.0%
Start Fuel Benchmark PMOA (mmBTU)	1,300	1,800	3,500
Start Fuel Actual (Average mmBTU)	1,300	1,700	3,516
Fuel Deviation (%)	0.0%	-5.6%	0.4%
Costs of Fuel Deviations (\$)	\$0	-\$400	\$62

**Definitions:**

1. Monthly Production = Plant Net MWH's
2. Capacity Factor
  - a. Service Hours = In Production or in Service State
  - b. Service Factor =  $SH / PH \times 100\%$
  - c. Capacity Factor =  $Production / 302MW \times PH$
  - d. Capacity Factor =  $Production / 280MW \times PH$
3. Monthly Equivalent Availability Factor (EAF) =  $(AH - EPDH - EFDH) / PH \times 100\%$
4. Forced Outage Rate =  $(FOH / (FOH + SH)) \times 100\%$
5. Heat Rate Deviation (HRD)
  - a. Fuel Cost = Cost of Fuel in \$/mmBTU
  - b. Average Heat Rate = The Average Heat Rate for the given Range
  - c. Heat Rate Deviation =  $(Heat Rate Average - Heat Rate Expected) / Heat Rate Expected \times 100\%$
  - d. Production = The Sum of Production for the given Range
  - e. Costs of Heat Rate Deviations =  $(Average Heat Rate - Expected Heat Rate) \times Production \times Cost of Fuel$
6. AGC Deviation-
  - a. MWH's = AGC Set Point Generation - LEC Actual Generation
  - b. Cost of Deviations = Fuel Cost x Heat Rate x Generation
7. Starting Reliability
  - a. Number of Starts = Start Count for Hot, Warm, and Cold
  - b. Start Time = Average Time from 0 Fuel Flow to Pmin
  - c. Start Fuel = Average Fuel Consumption to Pmin
  - d. Cost of Fuel Deviation =  $(Actual Fuel Consumed - Expected Fuel) \times Cost of Fuel$