



Huntington Plan Heat Rate Improvement Plan

Htg_2009_HRIP

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1. Revision History

Version	Status	Author	Reason for Issue	Date
1			2009 Plan Issue	March 31, 2009

2. Revision Control

This document is maintained by the PacifiCorp Energy Asset Management group.

3. Glossary of Terms

- 3.1. Actual Net Heat Rate (Btu/kWh)
Total actual heat input in Btu’s divided by actual net generation.
- 3.2. As-built Net Heat Rate (Btu/kWh)
Total guaranteed heat input, from the design heat balances in Btu’s divided by the guaranteed net generation, corrected for changes in equipment from design. This is the baseline number for the plant personnel when they make their annual reconciliation.
- 3.3. British thermal unit (Btu)
British thermal unit is defined as the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit.
- 3.4. Gross Heat Rate (Btu/kWh)
Total actual heat input in Btu’s divided by actual gross generation.
- 3.5. Net Generation (kWh)
Gross generation minus auxiliary or station usage
- 3.6. Planned Net Heat Rate (Btu/kWh)
Total budgeted heat input in Btu’s divided by the budgeted net generation. This number is the annual goal for the plant personnel to achieve.

4. Overall Plan and Objectives

- 4.1. Unit 1- Goals for 10-year plan
Figure 1, in the appendix, shows the ten-year heat rate plan for Huntington unit 1. The dips in the Planned Net Heat Rate in the years 2011 and 2015 are due to the work that is scheduled to take place during the planned outages in 2010 and 2014 (see section 7).
- 4.2. Unit 2- Goals for 10-year plan
Figure 2, in the appendix, shows the ten-year heat rate plan for Huntington unit 2. The dips in the Planned Net Heat Rate in the years 2012 and 2016

are due to the work that is scheduled to take place during the planned outages in 2011 and 2015 (see section 7).

5. Performance against last year's plan

5.1. Unit 1

Planned Net Heat Rate			10,177
Reconciliation to Planned Net Heat Rate	Planned	Actual	
Boiler Losses	80	(215)	(295)
Turbine Losses	377	336	(42)
Other Losses	(68)	85	153
Actual Net Heat Rate			9,993

Negative numbers in the table above are improvements to heat rate.

5.2. Unit 2

Planned Net Heat Rate			10,078
Reconciliation to Planned Net Heat Rate	Planned	Actual	
Boiler Losses	124	(239)	(362)
Turbine Losses	338	419	80
Other Losses	(263)	(119)	144
Actual Net Heat Rate			9,940

Negative numbers in the table above are improvements to heat rate.

6. Major Losses for Current Planned Net Heat Rate

This section of the heat rate plan identifies the reconciliation of the items that have the most impact between the As-built Net Heat Rate and the Planned Net Heat Rate.

6.1. Unit 1

As-Built Net Heat Rate	9,788
Boiler Losses	86
Turbine Losses	356
Other Losses	-59
Planned Net Heat Rate	10,170

6.2. Unit 2

As-Built Net Heat Rate	9,878
Boiler Losses	129
Turbine Losses	230
Other Losses	-167
<hr/>	<hr/>
Planned Net Heat Rate	10,071

7. Major Unit Specific Initiatives

This section identifies the major planned capital and operational activities to improve or regain lost heat rate for the current 10-year plan.

7.1. Unit 1

Table 1 shows the capital projects included in the 10-year plan that contribute to the recovery of lost heat rate. Numbers inside parentheses are negative impact on heat rate and represent improvement to the overall unit efficiency.

7.2. Unit 2

Table 2 shows the capital projects included in the 10-year plan that contribute to the recovery of lost heat rate. Numbers inside parentheses are negative impact on heat rate and represent improvement to the overall unit efficiency.

8. Annual Review and Update

This plan will be reviewed and updated annually by the Huntington plant management team by March 31.

9. Appendix

Figure 1
Huntington Unit 1
10-year Plan Heat Rate Goals

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
As-Built Net Heat Rate - Btu/kWh	9,795	9,794	9,793	9,787	9,794	9,794	9,791	9,790	9,790	9,790	9,790	9,788	9,788	9,788	9,788	9,788
Planned Net Heat Rate - Btu/kWh	10,447	10,089	10,320	10,026	10,177	10,170	10,169	9,647	9,703	9,742	9,766	9,595	9,606	9,671	9,771	9,762
Actual Net Heat Rate - Btu/kWh	10,334	10,270	9,573	9,935	9,993											
Capacity Factor	76%	79%	89%	89%	89%	86%	72%	91%	91%	89%	78%	92%	91%	89%	80%	92%
Annual Deviation from Plan - %	-1.08%	1.79%	-7.24%	-0.91%	-1.81%											
Four-year Average Deviation from Plan - %	-1.08%	0.35%	-2.18%	-1.86%	-2.04%											

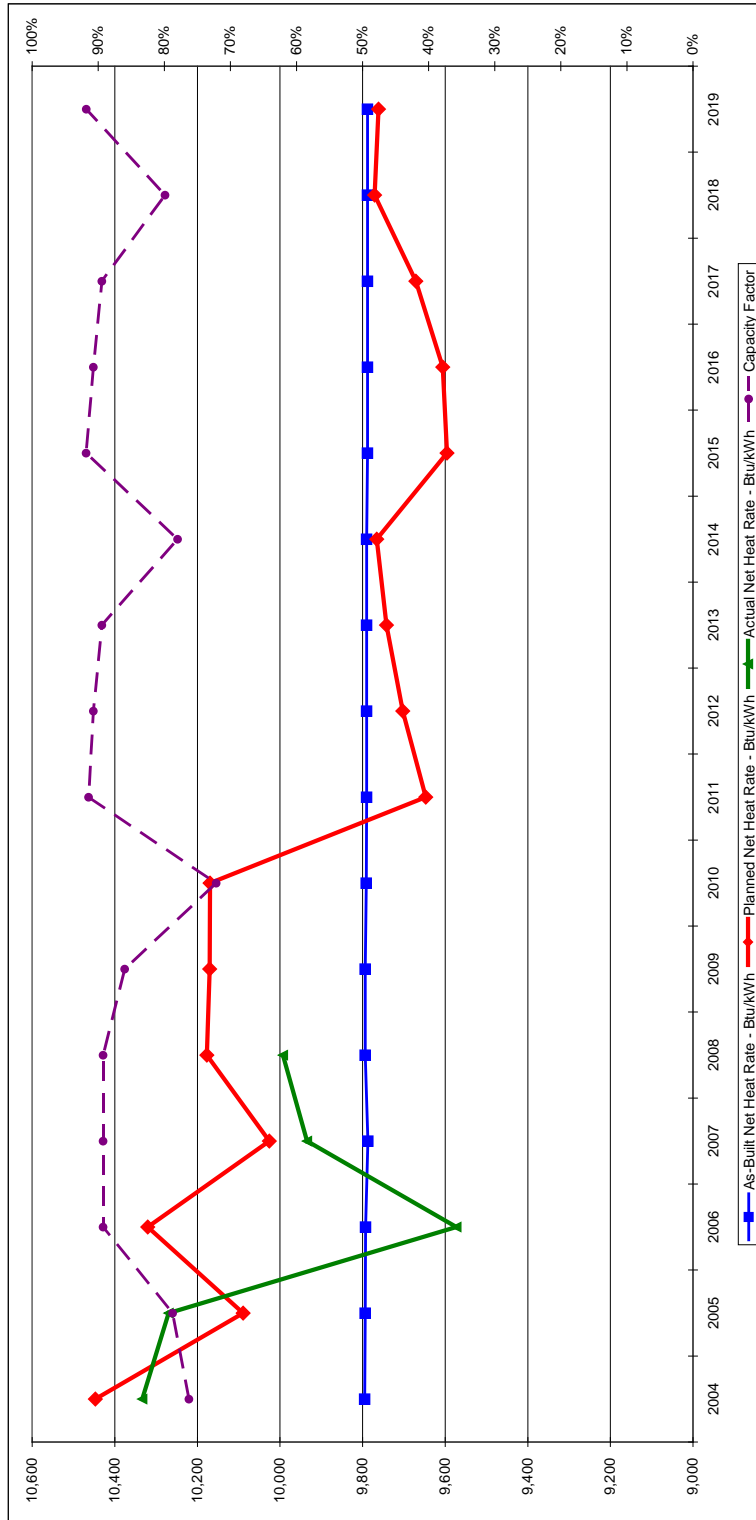
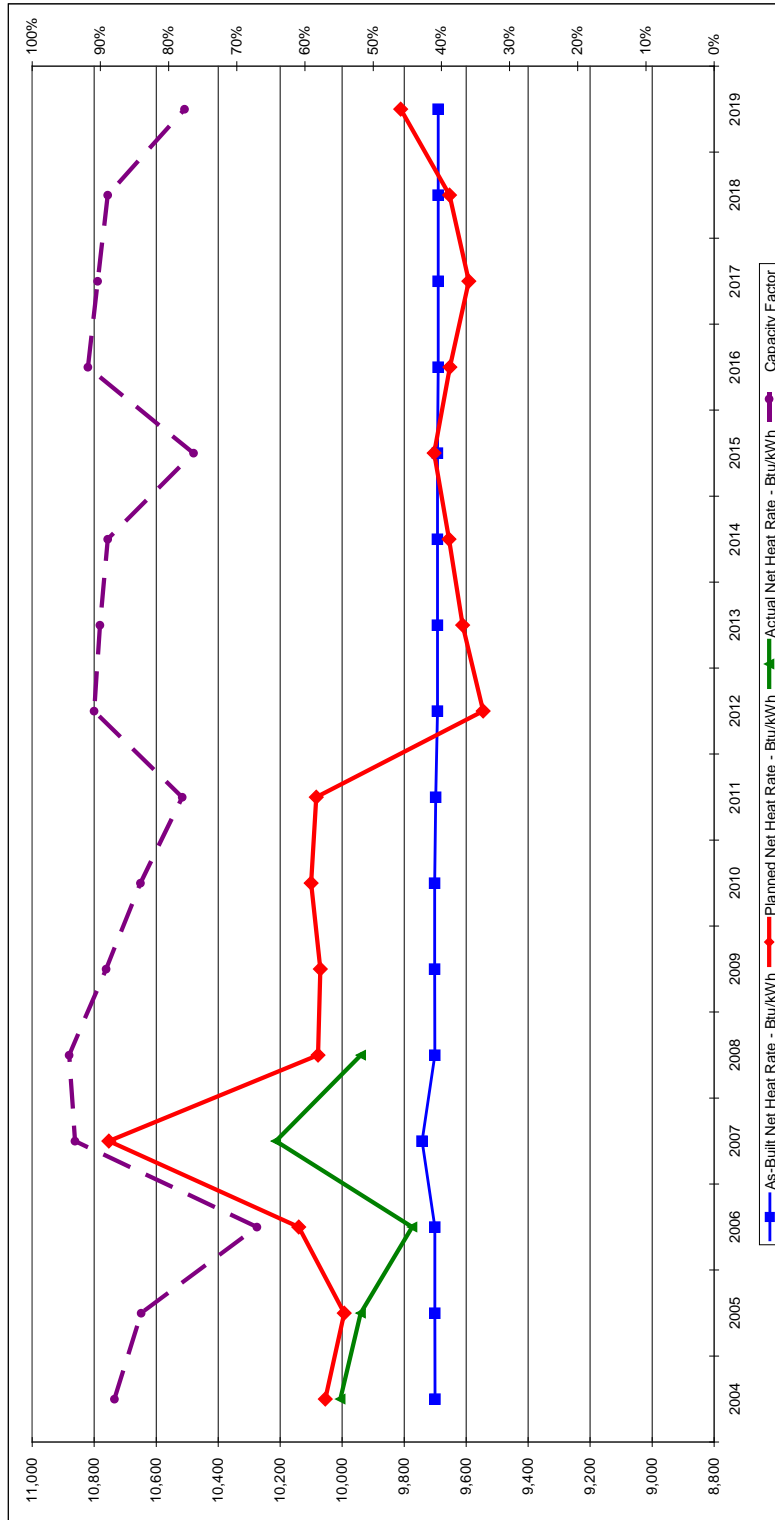


Figure 2
Huntington Unit 2
10-year Plan Heat Rate Goals

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
As-Built Net Heat Rate - Btu/kWh	9,700	9,701	9,701	9,742	9,701	9,702	9,702	9,698	9,692	9,692	9,692	9,692	9,690	9,690	9,690	9,690
Planned Net Heat Rate - Btu/kWh	10,055	9,993	10,140	10,753	10,078	10,071	10,100	10,084	9,545	9,612	9,655	9,703	9,652	9,591	9,654	9,811
Actual Net Heat Rate - Btu/kWh	10,006	9,940	9,774	10,214	9,940											
Capacity Factor	88%	84%	67%	94%	95%	89%	84%	78%	91%	90%	89%	76%	92%	90%	89%	78%
Annual Deviation from Plan - %	-0.48%	-0.53%	-3.61%	-5.01%	-1.37%											
Four-year Average Deviation from Plan - %	-0.48%	-0.51%	-1.54%	-2.41%	-2.63%											



**Table 1
Huntington Unit 1
10-year Plan Heat Rate Improvement Projects**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Budgeted / Planned Heat Rate Changes, Net basis (Improvements are negative)											
3 Feedwater Heater Replacement (2011)			-10	-10	-10	-10	-10	-10	-10	-10	-10
Cooling Tower Fill (2010)		-2	-10	-10	-10	-10	-10	-10	-10	-10	-10
Boiler Optimization (2014)					0		-40	-40	-40	-40	-40
Scrubber Wet Stack Conversion (Aux steam r		-13	-75	-75	-75	-75	-75	-75	-75	-75	-75
Steam Air Heaters (est)(2011)			10	10	10	10	10	10	10	10	10
Dense Pack Turbine		-29	-350	-350	-350	-350	-350	-350	-350	-350	-350
Low NOX Burners (LOI effect)			25	25	25	25	25	25	25	25	25
Total adjustments related to Capital Projects	0	-44	-410	-410	-410	-410	-450	-450	-450	-450	-450
Budgeted / Planned Auxiliary Load Changes											
Reduced auxiliary load benefit of Budgeted / F	0	-124	-168	-168	-168	-168	-280	-280	-280	-280	-280
Total Auxiliary Load Changes		0	0	0	0	0	0	0	0	0	0
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
Turbine upgrade Dense Pack (18nMW 2010)		2	18	18	18	18	18	18	18	18	18
Total Capacity Changes	2	2	18	18	18	18	18	18	18	18	18

**Table 2
Huntington Unit 2
10-year Plan Heat Rate Improvement Projects**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Budgeted / Planned Heat Rate Changes, Net basis (Improvements are negative)											
Cooling Tower Fill			-2	-10	-10	-10	-10	-10	-10	-10	-10
Boiler Optimization (2015)							0	-40	-40	-40	-40
Steam Air Heaters	10	10	10	10	10	10	10	10	10	10	10
2 LP FWHeaters				-5	-5	-5	-5	-5	-5	-5	-5
Dense Pack Turbine			-31	-373	-373	-373	-373	-373	-373	-373	-373
Total adjustments related to Capital Projects	10	10	-23	-378	-378	-378	-378	-418	-418	-418	-418
Budgeted / Planned Auxiliary Load Changes											
Reduced auxiliary load benefit of Budgeted / F	KW	25	-58	-12	-12	-12	-12	-112	-112	-112	-112
Complete Unit 1 & 2 BA Drag Chain Conveyor	KW		-73	-440	-440	-440	-440	-440	-440	-440	-440
Total Auxiliary Load Changes	KW	25	-131	-452	-452	-452	-452	-552	-552	-552	-552
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
Turbine upgrade Dense Pack (18mMW 2010)	MW			18	18	18	18	18	18	18	18
	MW										
Total Capacity Changes	MW	0	0	0	18	18	18	18	18	18	18

10. Required Signatures

Performance Engineer – Huntington Plant		Ron Hall	
Signature:		Date:	

Manager, Engineering – Huntington Plant		Glenn Pinterich	
Signature:		Date:	

Managing Director – Huntington Plant		DJ Cunningham	
Signature:		Date:	