



Huntington Plan Heat Rate Improvement Plan
Htg_2008_HRIP

Revision 0.00

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1. Revision History

Version	Status	Author	Reason for Issue	Date

2. Revision Control

This document is maintained by the PacifiCorp Energy Asset Management group. The latest revision of this document can be obtained at:

[Inset hyper link to folder]

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 1. 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			10,320
Reconciliation to Planned Net Heat Rate	Planned	Actual	
Boiler Losses	150	5	(145)
Turbine Losses	(3)	(250)	(247)
Other Losses	-	(135)	(135)
Actual Net Heat Rate			9,793

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

5.2. Unit 2

Planned Net Heat Rate			9,970
Reconciliation to Planned Net Heat Rate	Planned	Actual	
Boiler Losses	105	72	(33)
Turbine Losses	103	25	(78)
Other Losses	80	(5)	(85)
Actual Net Heat Rate			9,774

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	9,787
Boiler losses	75
Turbine losses	354
Other losses	(43)
Planned Net Heat Rate	10,173

6.2. Unit 2

As-built Net Heat Rate	9,879
Boiler losses	113
Turbine losses	312
Other losses	(115)
<u>Planned Net Heat Rate</u>	<u>10,189</u>

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

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

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
As-built Net Heat Rate - Btu/kWh	9,794	9,793	9,793	9,793	9,787	9,787	9,787	9,787	9,824	9,825	9,825	9,825	9,824	9,825	9,825
Planned Net Heat Rate - Btu/kWh	10,317	10,447	10,089	10,320	10,132	10,183	10,217	10,245	10,067	10,123	10,177	10,192	10,108	10,129	10,135
Actual Net Heat Rate - Btu/kWh	10,071	10,273	10,332	9,573	9,880	9,880	9,890	9,825	10,067	10,123	10,177	10,192	10,108	10,129	10,135
Capacity Factor	90%	77%	79%	89%	88%	92%	89%	72%	92%	91%	90%	78%	92%	91%	90%
Annual Deviation from Plan - %	-2.39%	-1.67%	2.41%	-7.24%	-2.49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Four-year Average Deviation from Plan - %				-2.25%	-2.27%										

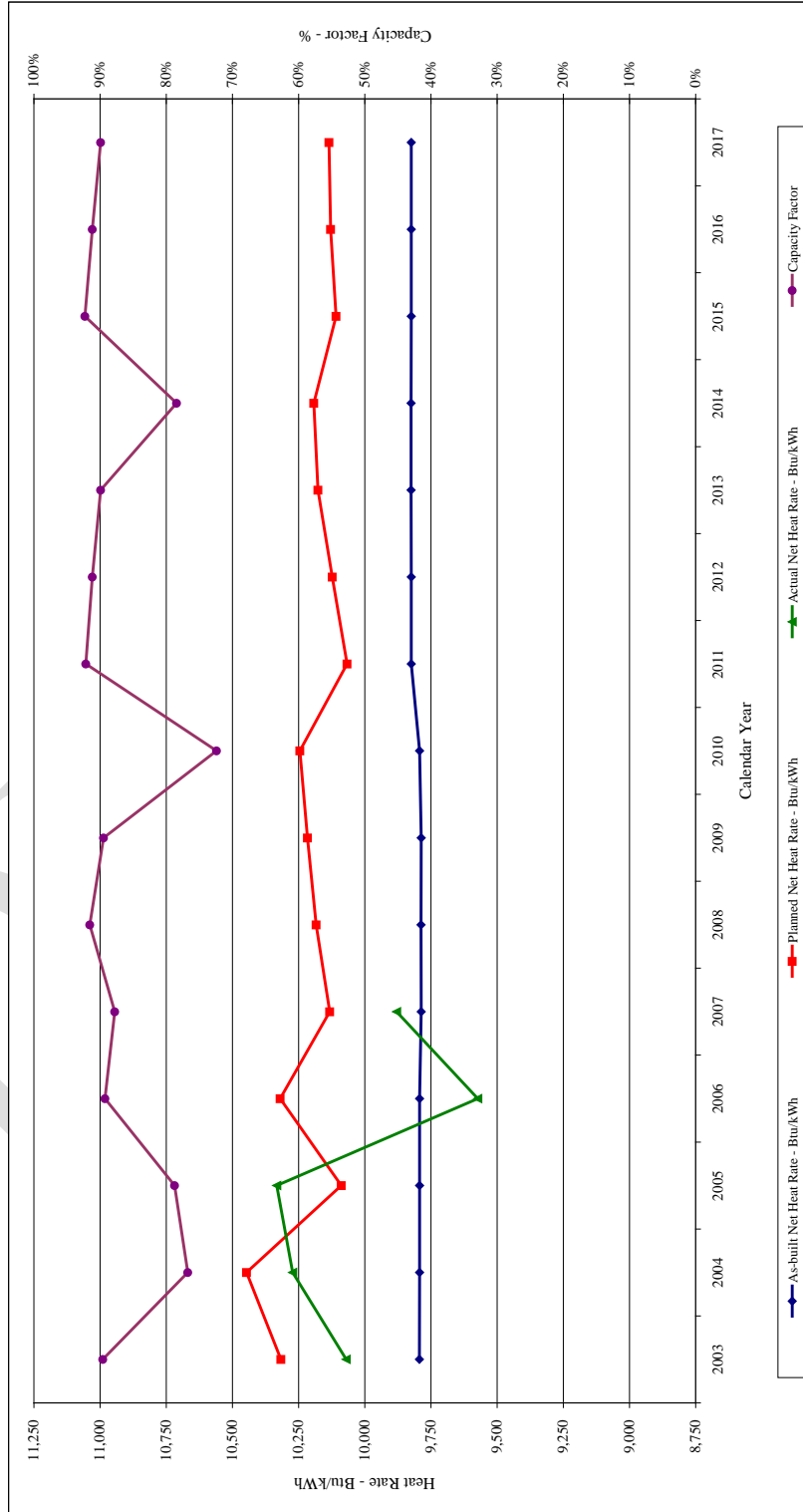
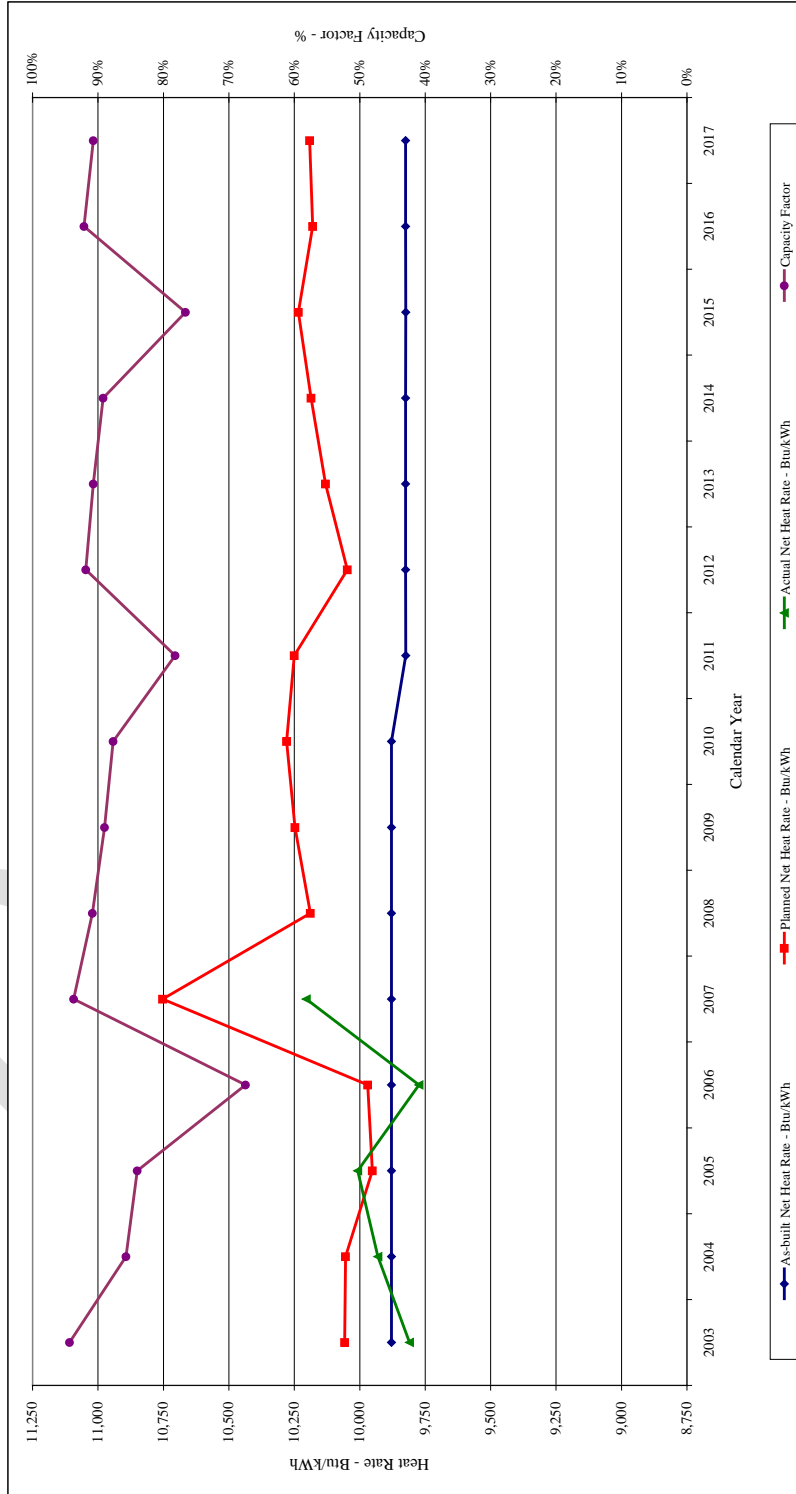


Figure 2
Huntington Unit 2
10-year Plan Heat Rate Goals

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
As-built Net Heat Rate - Btu/kWh	9,879	9,879	9,879	9,879	9,879	9,879	9,879	9,879	9,824	9,825	9,825	9,825	9,824	9,825	9,825
Planned Net Heat Rate - Btu/kWh	10,058	10,055	9,952	9,970	10,753	10,189	10,247	10,279	10,250	10,047	10,131	10,186	10,235	10,180	10,191
Actual Net Heat Rate - Btu/kWh	9,810	9,931	10,008	9,774	10,205										
Capacity Factor	94%	86%	84%	67%	94%	91%	89%	88%	78%	92%	91%	89%	77%	92%	91%
Annual Deviation from Plan - %	-2.46%	-1.23%	0.56%	-1.97%	-5.10%										
Four-year Average Deviation from Plan - %			-1.28%		-1.99%										



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

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Budgeted Capital Projects related adjustments										
Turbine Spill Strips and Packing	(20)	(15)	(10)	(30)	(25)	(20)	(15)	(30)	(25)	(20)
Cooling Tower Fill			(2)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Boiler Optimization		(20)	(40)	(40)	(40)	(40)	(40)	(40)	(40)	(40)
Scrubber Wet Stack Conversion			(13)	(75)	(75)	(75)	(75)	(75)	(75)	(75)
Steam Air Heaters (est)			10	10	10	10	10	10	10	10
Total adjustments related to Capital Projects	(20)	(35)	(55)	(145)	(140)	(135)	(130)	(145)	(140)	(135)
Budgeted / Planned Auxiliary Load Changes										
Reduced auxiliary load/benefit of Budgeted / Planned Heat Rate Changes	(263)	(305)	(361)	(612)	(598)	(584)	(570)	(612)	(598)	(584)
Clean Air Initiative - Baghouse			367	2,200	2,200	2,200	2,200	2,200	2,200	2,200
Total Auxiliary Load Changes	(263)	(305)	6	1,588	1,602	1,616	1,630	1,588	1,602	1,616
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)										
Clean Air Initiative Additions										
Total Capacity Changes	0	0	0	0	0	0	0	0	0	0

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

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Budgeted Capital Projects related adjustments										
Turbine Spill Strips and Packing	(25)	(20)	(15)	(10)	(30)	(25)	(20)	(15)	(30)	(25)
Cooling Tower Fill				(2)	(10)	(10)	(10)	(10)	(10)	(10)
Total adjustments related to Capital Projects	(25)	(20)	(15)	(12)	(40)	(35)	(30)	(25)	(40)	(35)
Budgeted / Planned Auxiliary Load Changes										
Reduced auxiliary load benefit of Budgeted / Planned Heat Rate Changes	(456)	(494)	(481)	(474)	(543)	(531)	(518)	(506)	(543)	(531)
Complete Unit 1 & 2 BA Drag Chain Conveyor (eliminate ash water pumps)				(73)	(440)	(440)	(440)	(440)	(440)	(440)
Total Auxiliary Load Changes	7,344	7,306	7,319	7,253	6,817	6,829	6,842	6,854	6,817	6,829
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)										
Clean Air Initiative Additions	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Total Capacity Changes	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)

10. Required Signatures

Performance Engineer – Huntington Plant		Ron Hall	
Signature:		Date:	

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

Managing Director, Huntington Plant		Reg Soepnal	
Signature:		Date:	

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