



Dave Johnston Plan Heat Rate Improvement Plan
DJ_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 Dave Johnston unit 1. The dips in the Planned Net Heat Rate in the years 2013 and 2017 are due to the work that is scheduled to take place during the planned outages in 2013 and 2017 (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 Dave Johnston unit 2. The dips in the Planned Net Heat Rate in the years 2013

and 2018 are due to the work that is scheduled to take place during the planned outages in 2012 and 2017 (see section 7).

4.3. Unit 3 - Goals for 10-year Plan

Figure 3, in the appendix, shows the ten-year heat rate plan for Dave Johnston unit 3. The dips in the Planned Net Heat Rate in the years 2011 and 2014 are due to the work that is scheduled to take place during the planned outages in 2010 and 2014 (see section 7).

4.4. Unit 4 - Goals for 10-year Plan

Figure 4, in the appendix, shows the ten-year heat rate plan for Dave Johnston unit 4. The dips in the Planned Net Heat Rate in the years 2010, 2013 and 2016 are due to the work that is scheduled to take place during the planned outages in 2009, 2012 and 2016 (see section 7).

5. Performance against last year's plan

5.1. Unit 1

Planned Net Heat Rate				11,061
Reconciliation to Planned Net Heat Rate	Planned	Actual		
Boiler Losses	(12)	(14)	(2)	
Turbine Losses	706	1,043	338	
Other Losses	(21)	191	213	
Actual Net Heat Rate				11,610

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

5.2. Unit 2

Planned Net Heat Rate				10,959
Reconciliation to Planned Net Heat Rate	Planned	Actual		
Boiler Losses	(10)	14	23	
Turbine Losses	679	917	238	
Other Losses	(91)	110	202	
Actual Net Heat Rate				11,421

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

5.3. Unit 3

Planned Net Heat Rate				11,335
Reconciliation to Planned Net Heat Rate	Planned	Actual		
Boiler Losses	0	(26)	(26)	

Turbine Losses	544	395	(149)
Other Losses	300	198	(102)
<hr/>			
Actual Net Heat Rate			11,058

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

5.4. Unit 4

Planned Net Heat Rate			10,758
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Reconciliation to Planned Net Heat Rate	Planned	Actual	
Boiler Losses	(80)	19	99
Turbine Losses	749	1,094	345
Other Losses	(162)	53	215
<hr/>			
Actual Net Heat Rate			11,418

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	10,389
Boiler Losses	(14)
Turbine Losses	548
Other Losses	99
<hr/>	
Planned Net Heat Rate	11,022

6.2. Unit 2

As-Built Net Heat Rate	10,380
Boiler Losses	11
Turbine Losses	677
Other Losses	(55)
<hr/>	
Planned Net Heat Rate	11,013

6.3. Unit 3

As-Built Net Heat Rate	10,490
Boiler Losses	32
Turbine Losses	594
Other Losses	321
Planned Net Heat Rate	11,438

6.4. Unit 4

As-Built Net Heat Rate	10,252
Boiler Losses	(69)
Turbine Losses	454
Other Losses	(87)
Planned Net Heat Rate	10,549

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.

7.3. Unit 3

Table 3 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.

7.4. Unit 4

Table 4 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 Dave Johnston plant management team by March 31.

9. Appendix

Figure 1
Dave Johnston 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	10,390	10,390	10,390	10,389	10,390	10,390	10,390	10,390	10,390	10,390	10,390	10,390	10,390	10,390	10,390	10,390
Planned Net Heat Rate - Btu/kWh	11,120	11,068	11,090	11,201	11,061	11,022	11,131	11,089	11,217	11,115	11,139	11,146	11,152	11,215	11,114	11,085
Actual Net Heat Rate - Btu/kWh	11,021	11,066	11,020	11,156	11,610											
Capacity Factor	89%	92%	91%	88%	79%	92%	90%	89%	88%	80%	92%	91%	91%	89%	80%	92%
Annual Deviation from Plan - %	-0.89%	-0.02%	-0.63%	-0.40%	4.96%											
Four-year Average Deviation from Plan - %			-0.52%	-0.49%	0.98%											

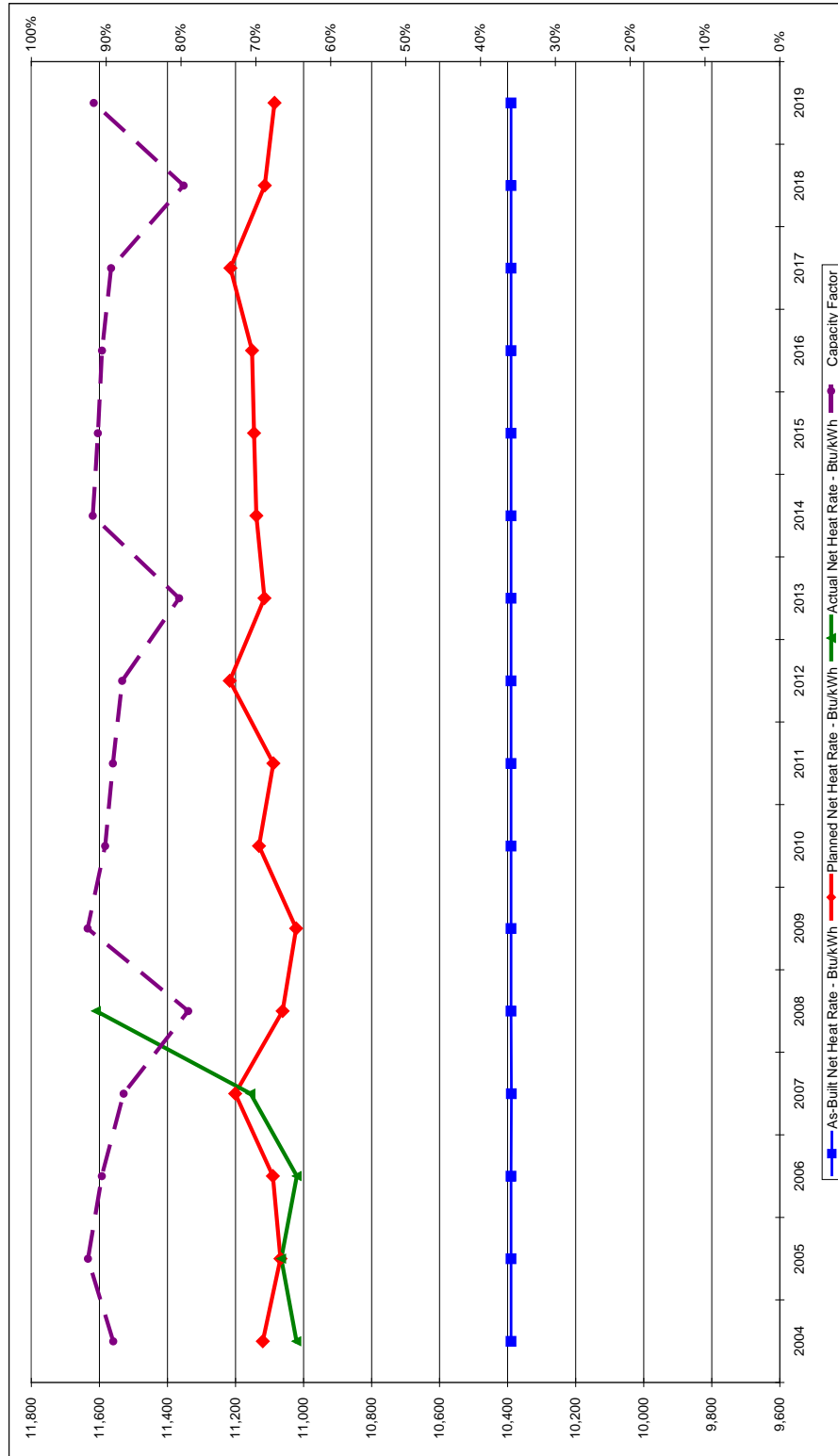


Figure 2
Dave Johnston Unit 2
10-year Plan Heat Rate Goals

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
As-Built Net Heat Rate - Btu/kWh	10,390	10,390	10,390	10,371	10,381	10,384	10,387	10,389	10,389	10,389	10,389	10,389	10,389	10,389	10,389	10,389
Planned Net Heat Rate - Btu/kWh	11,119	11,171	11,090	10,804	10,959	11,013	11,015	11,118	11,174	10,907	10,904	11,009	11,007	11,009	10,906	10,941
Actual Net Heat Rate - Btu/kWh	10,920	11,014	11,169	10,987	11,421											
Capacity Factor	88%	91%	89%	79%	83%	93%	91%	89%	79%	93%	91%	90%	88%	79%	93%	91%
Annual Deviation from Plan - %	-1.78%	-1.41%	0.71%	1.69%	4.22%											
Four-year Average Deviation from Plan - %	-1.78%	-1.60%	-0.83%	-0.20%	1.30%											

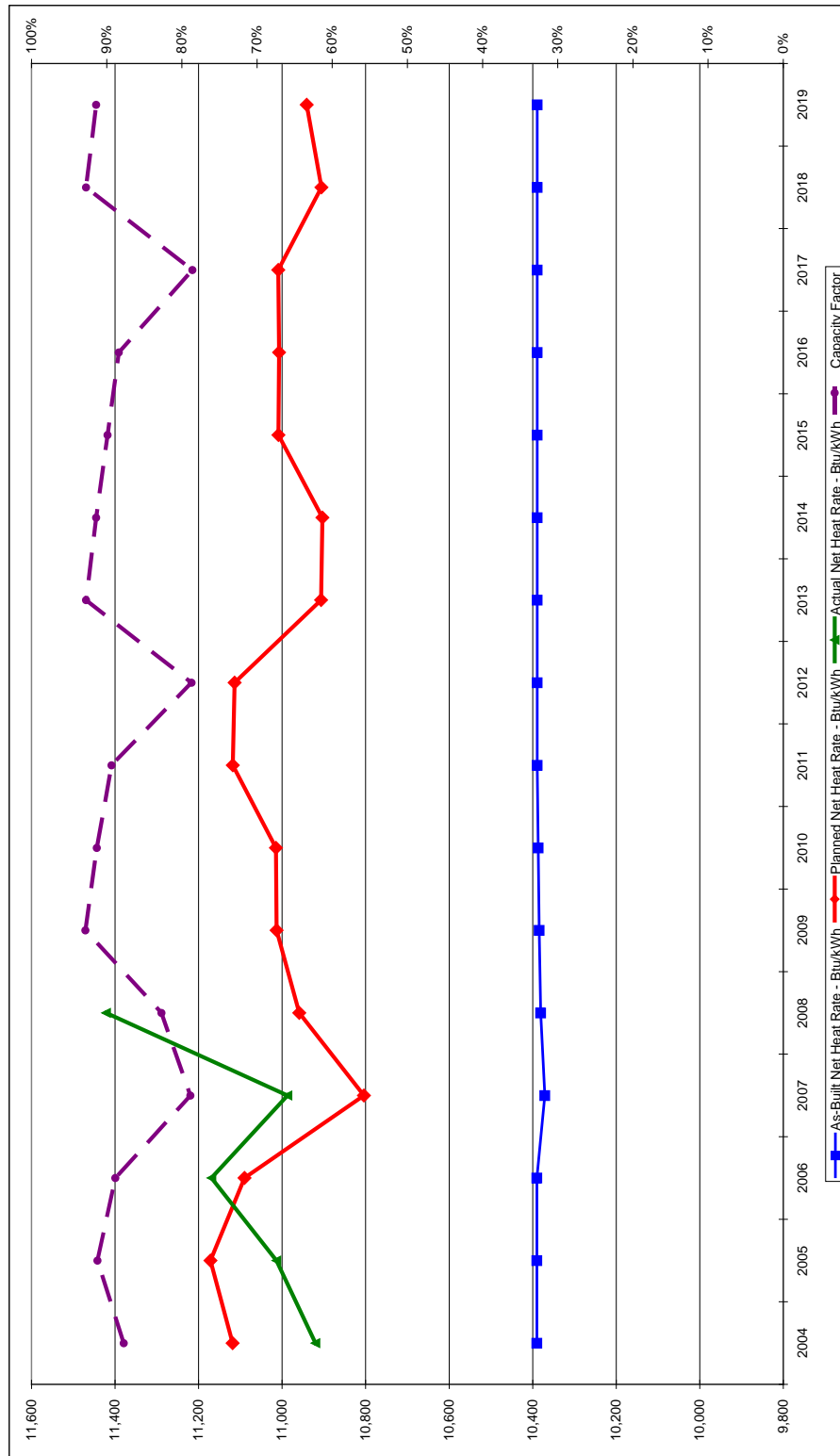


Figure 3
Dave Johnston Unit 3
10-year Plan Heat Rate Goals

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
As-Built Net Heat Rate - Btu/kWh	10,490	10,490	10,490	10,488	10,490	10,490	10,489	10,489	10,488	10,488	10,488	10,488	10,488	10,488	10,488	10,488
Planned Net Heat Rate - Btu/kWh	11,007	11,091	11,200	11,171	11,335	11,438	11,396	11,309	11,360	11,399	11,348	11,355	11,356	11,359	11,341	11,179
Actual Net Heat Rate - Btu/kWh	10,996	11,207	11,487	11,447	11,058											
Capacity Factor	87%	80%	90%	88%	92%	87%	75%	90%	89%	88%	81%	90%	89%	88%	91%	90%
Annual Deviation from Plan - %	-0.10%	1.05%	2.56%	2.47%	-2.44%											
Four-year Average Deviation from Plan - %	-0.10%	0.47%	1.17%	1.49%	0.91%											

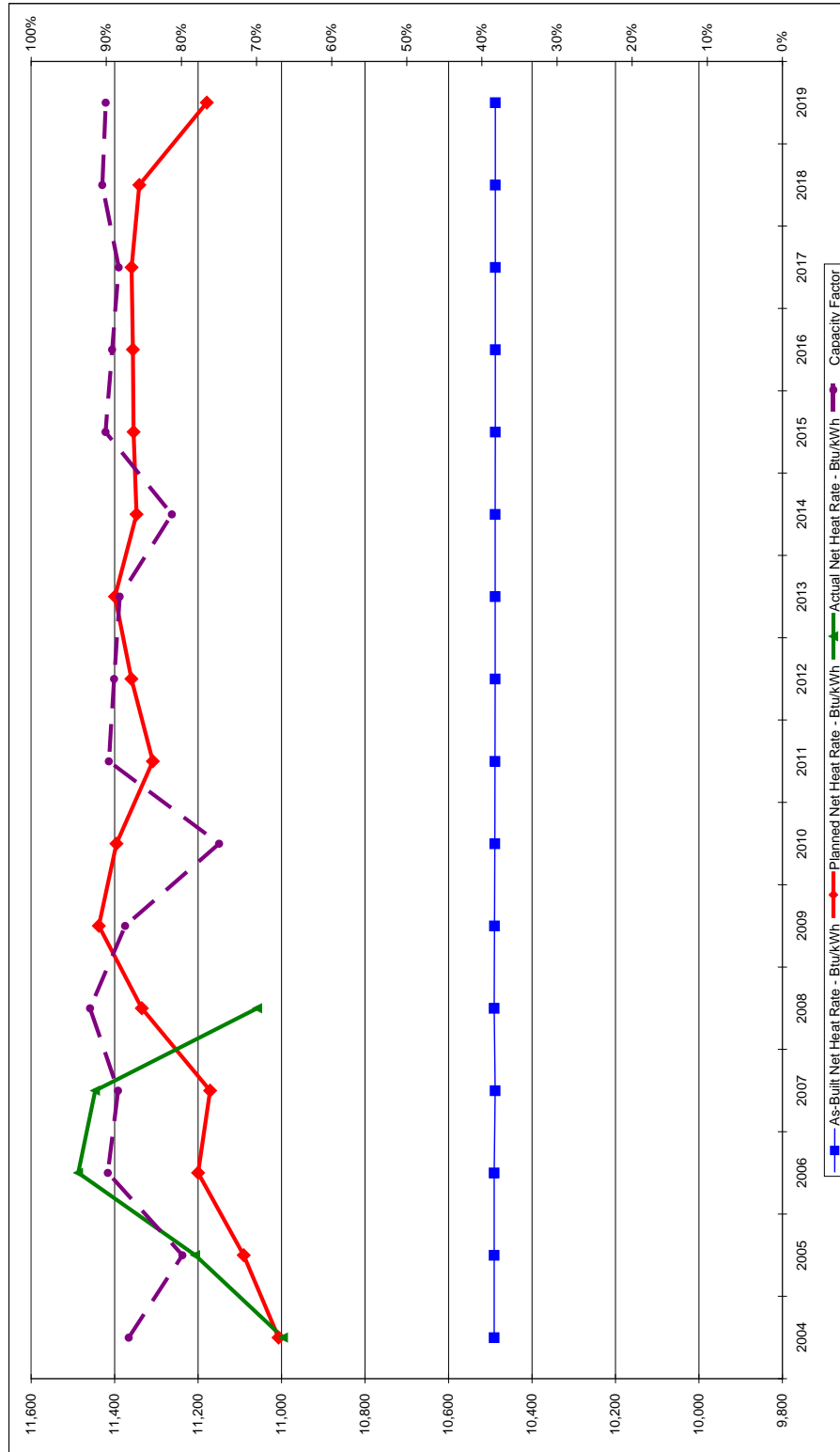


Figure 4
Dave Johnston Unit 4
10-year Plan Heat Rate Goals

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
As-Built Net Heat Rate - Btu/kWh	10,252	10,252	10,252	10,252	10,252	10,245	10,242	10,242	10,230	10,225	10,231	10,231	10,232	10,232	10,232	10,232
Planned Net Heat Rate - Btu/kWh	11,084	11,098	11,080	11,062	10,758	10,549	10,487	10,587	10,729	10,517	10,611	10,715	10,613	10,613	10,608	10,547
Actual Net Heat Rate - Btu/kWh	10,873	10,978	11,263	11,233	11,418											
Capacity Factor	88%	84%	82%	84%	81%	66%	88%	88%	77%	89%	89%	90%	79%	89%	90%	90%
Annual Deviation from Plan - %	-1.91%	-1.08%	1.65%	1.55%	6.13%											
Four-year Average Deviation from Plan - %	-1.91%	-1.49%	-0.44%	0.06%	2.06%											

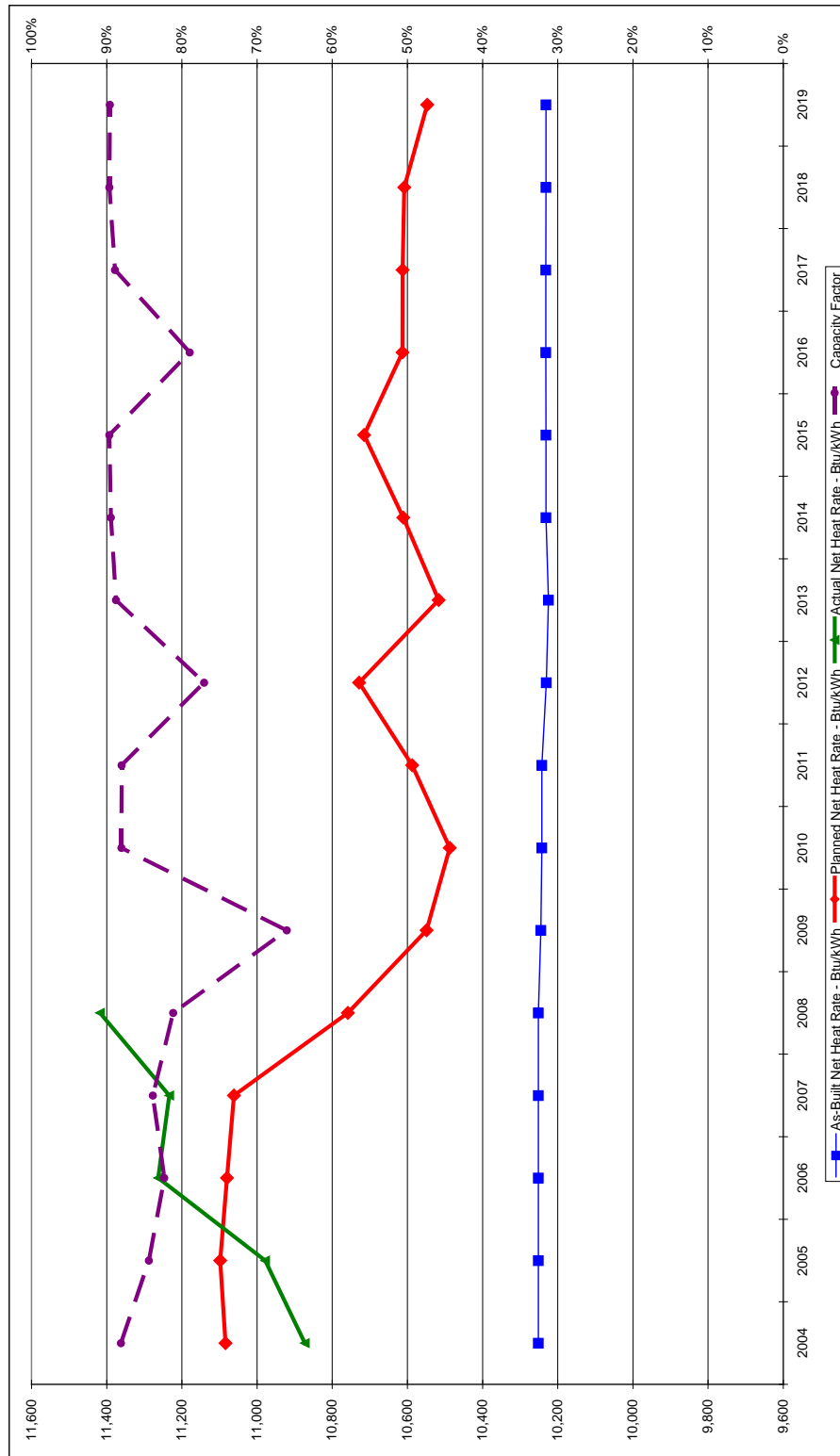


Table 1
Dave Johnston Unit 1
10-year Plan Heat Rate Improvement Projects

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Budgeted / Planned Heat Rate Changes, Net basis (Improvements are negative)											
Total adjustments related to Capital Projects	0	0	0	0	0	0	0	0	0	0	0
Budgeted / Planned Auxiliary Load Changes											
Reduced auxiliary load benefit of Budgeted / Planned	0	0	0	0	0	0	0	0	0	0	0
Total Auxiliary Load Changes	0	0	0	0	0	0	0	0	0	0	0
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
Total Capacity Changes	0	0	0	0	0	0	0	0	0	0	0

Table 2
Dave Johnston 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)											
Pulverizer/PA Fan Controls Replace - (2008)	Btu/kWh	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
Major Turbine OH	Btu/kWh	-80	0	0	0	0	0	0	0	0	0
Total adjustments related to Capital Projects	Btu/kWh	-100	-60	-20	-20	-20	-20	-20	-20	-20	-20
Budgeted / Planned Auxiliary Load Changes											
Reduced auxiliary load benefit of Budgeted / Plann	KW	-63	-38	-13	-13	-13	-13	-13	-13	-13	-13
Total Auxiliary Load Changes	KW	-63	-38	-13	-13	-13	-13	-13	-13	-13	-13
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
	MW										
Total Capacity Changes	MW	0	0	0	0	0	0	0	0	0	0

Table 3
Dave Johnston Unit 3
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)											
Glycol Air Pre-Heaters (2010)		-10	-14	-16	-18	-20	-22	-22	-22	-22	-22
3C Mill PA Flow indication 2010		-5	-10	-10	-10	-10	-10	-10	-10	-10	-10
Total adjustments related to Capital Projects		-10	-17	-24	-26	-30	-32	-32	-32	-32	-32
Budgeted / Planned Auxiliary Load Changes											
Reduced auxiliary load benefit of Budgeted / Plann		-19	-32	-45	-49	-53	-57	-60	-60	-60	-60
Total Auxiliary Load Changes		-19	-32	-45	-49	-53	-57	-60	-60	-60	-60
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
Clean Air Initiative - DFGD (85%) LNB		0	0	0	0	0	0	0	0	0	0
Unit Rerated after Environmental Projects (2010 +1		5	10	10	10	10	10	10	10	10	10
Total Capacity Changes		0	5	10	10	10	10	10	10	10	10

Table 4
Dave Johnston Unit 4
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)											
Digital Control System	Btu/kWh	-35	-70	-70	-70						
FW Heater Level Controls Replace	Btu/kWh	-15	-15	-15	-15						
AH Basket Replacement	Btu/kWh	-25	-25	-20	-20	-10	-10	-15	-15	-15	-15
AH Sootblowers	Btu/kWh	-15	-15	-10	-10	-14	-16	-18	-20	-22	-22
Glycol Air Pre-Heaters	Btu/kWh			-10	-12	-14	-16	-18	-20	-22	-22
Turbine Upgrade Dense Pack (12 MWn in 2012)	Btu/kWh			-161	-242	-242	-242	-242	-242	-242	-242
Total adjustments related to Capital Projects	Btu/kWh	-90	-125	-291	-374	-281	-283	-275	-277	-279	-279
Budgeted / Planned Auxiliary Load Changes											
Reduced auxiliary load benefit of Budgeted / Planned	KW	-231	-321	-321	-748	-721	-727	-706	-711	-716	-716
Total Auxiliary Load Changes	KW	-231	-321	-321	-748	-721	-727	-706	-711	-716	-716
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
Clean Air Initiative - DFGD (90%), BH, LNB	MW			-3	-4	-4	-4	-4	-4	-4	-4
Turbine Upgrade Dense Pack (12 MWn in 2012)	MW			6	10	10	10	10	10	10	10
Total Capacity Changes	MW	0	0	3	6	6	6	6	6	6	6

10. Required Signatures

Performance Engineer – Dave Johnston Plant		Teresa Jorris	
Signature:	{ signature on file }	Date:	26Mar09

Engineering Manager – Dave Johnston Plant		Mark Panasuk	
Signature:	{ signature on file }	Date:	30Mar09

Managing Director – Dave Johnston Plant		Gary Slanina	
Signature:	{ signature on file }	Date:	30Mar09