

ภาคผนวก จ

ผลการตรวจวัดคุณภาพอากาศที่ระบายออกจากปล่องโรงไฟฟ้า

ผลการตรวจวัดคุณภาพอากาศที่ระบายออกจากปล่องโรงไฟฟ้า
แบบต่อเนื่อง (CEMS)

ตารางที่ จ-1 สรุปผลการตรวจวัดคุณภาพอากาศที่ระบายออกจากปล่องโรงไฟฟ้าแบบต่อเนื่อง (CEMS)

โรงไฟฟ้าพระนครเหนือ ชุดที่ 1 ระหว่างเดือนมกราคม-มิถุนายน 2567

โรงไฟฟ้าชุดที่ 1	ดัชนีที่ตรวจวัด	มกราคม	กุมภาพันธ์	มีนาคม	เมษายน	พฤษภาคม	มิถุนายน	ค่ามาตรฐาน	ค่าควบคุม
เครื่องที่ 1	Flow (KNm ³ /hr)								
	ค่าต่ำสุด	1,430.05	1,436.04	1,365.36	1,427.00	1,466.65	1,407.65	-	-
	ค่าสูงสุด	1,471.27	1,475.91	1,495.83	1,485.05	1,507.70	1,496.27	-	-
	ค่าเฉลี่ย	1,452.37	1,453.56	1,456.10	1,475.64	1,487.75	1,484.97	-	-
	NOx (ppm)								
	ค่าต่ำสุด	40.87	40.85	39.99	44.98	41.77	44.12	120	96
	ค่าสูงสุด	49.28	44.05	47.97	49.90	57.25	57.22	120	96
	ค่าเฉลี่ย	43.99	42.02	43.66	47.61	49.38	50.37	120	96
	O ₂ (%)								
	ค่าต่ำสุด	13.31	13.25	13.19	13.12	12.69	12.98	-	-
	ค่าสูงสุด	13.80	13.64	13.73	13.64	13.65	13.55	-	-
	ค่าเฉลี่ย	13.41	13.34	13.36	13.29	13.11	13.17	-	-
เครื่องที่ 2	Flow (KNm ³ /hr)								
	ค่าต่ำสุด	1,294.57	1,304.87	1,197.19	1,188.42	564.78	1,383.65	-	-
	ค่าสูงสุด	1,489.47	1,455.51	1,533.48	1,453.77	1,490.46	1,473.38	-	-
	ค่าเฉลี่ย	1,424.46	1,392.93	1,328.91	1,344.20	1,195.16	1,462.16	-	-
	NOx (ppm)								
	ค่าต่ำสุด	36.75	37.93	37.02	39.89	39.80	40.11	120	96
	ค่าสูงสุด	46.17	45.87	45.97	49.12	47.97	50.41	120	96
	ค่าเฉลี่ย	38.24	39.13	40.80	42.75	41.31	42.10	120	96
	O ₂ (%)								
	ค่าต่ำสุด	13.24	13.25	13.19	13.14	13.14	13.13	-	-
	ค่าสูงสุด	13.74	13.60	13.79	13.63	13.59	13.68	-	-
	ค่าเฉลี่ย	13.34	13.32	13.37	13.31	13.22	13.26	-	-

หมายเหตุ : - หมายถึง ไม่มีการกำหนดค่ามาตรฐานหรือค่าควบคุม

ตารางที่ จ-2 สรุปผลการตรวจวัดคุณภาพอากาศที่ระบายออกจากปล่องโรงไฟฟ้าแบบต่อเนื่อง (CEMS)

โรงไฟฟ้าพระนครเหนือ ชุดที่ 2 ระหว่างเดือนมกราคม-มิถุนายน 2567

โรงไฟฟ้าชุดที่ 2	ดัชนีที่ตรวจวัด	มกราคม	กุมภาพันธ์	มีนาคม	เมษายน	พฤษภาคม	มิถุนายน	ค่ามาตรฐาน	ค่าควบคุม
เครื่องที่ 1	Flow (KNm ³ /hr)								
	ค่าต่ำสุด	1,417.37	1,441.43	1,461.13	1,391.13	1,469.07	TRNRND	-	-
	ค่าสูงสุด	1,893.95	1,791.11	1,883.42	1,880.70	1,827.43	TRNRND	-	-
	ค่าเฉลี่ย	1,648.73	1,580.80	1,678.77	1,628.46	1,638.52	TRNRND	-	-
	NOx (ppm)								
	ค่าต่ำสุด	2.10	2.70	2.97	3.43	3.93	TRNRND	120	70
	ค่าสูงสุด	6.40	8.20	8.24	6.13	5.65	TRNRND	120	70
	ค่าเฉลี่ย	4.19	4.50	5.48	4.99	4.53	TRNRND	120	70
	O ₂ (%)								
เครื่องที่ 2	ค่าต่ำสุด	12.80	13.00	12.55	12.56	12.87	TRNRND	-	-
	ค่าสูงสุด	13.40	13.30	13.24	13.19	13.11	TRNRND	-	-
	ค่าเฉลี่ย	13.16	13.14	12.95	13.02	12.99	TRNRND	-	-
	Flow (KNm ³ /hr)								
	ค่าต่ำสุด	900.54	1,540.13	TRNRND	1,567.95	1,091.09	778.07	-	-
	ค่าสูงสุด	1,814.65	1,693.60	TRNRND	1,848.08	1,894.18	1,940.71	-	-
	ค่าเฉลี่ย	1,416.97	1,616.86	TRNRND	1,697.61	1,620.37	1,397.92	-	-
	NOx (ppm)								
	ค่าต่ำสุด	8.00	8.00	TRNRND	8.85	5.90	6.29	120	70
	ค่าสูงสุด	11.10	8.20	TRNRND	12.62	10.83	9.22	120	70
	ค่าเฉลี่ย	9.82	8.10	TRNRND	11.27	9.04	7.76	120	70
	O ₂ (%)								
	ค่าต่ำสุด	13.00	13.20	TRNRND	13.00	12.68	12.65	-	-
	ค่าสูงสุด	13.20	13.20	TRNRND	13.19	13.15	13.17	-	-
	ค่าเฉลี่ย	13.13	13.20	TRNRND	13.11	13.06	13.02	-	-

หมายเหตุ : - หมายถึง ไม่มีการกำหนดค่ามาตรฐานหรือค่าควบคุม

TRNRND = Turn Around งานบำรุงตามวาระ (Planned Outage)

ผลการตรวจสอบความถูกต้องของการทำงานระบบ CEMS

Relative Accuracy Determination for CEMS: North Bangkok Combined Cycle Power Plant Unit 11

Plant:	North Bangkok Combined Cycle Power Plant
Source Identification:	NB-C11
Date:	11 January 2024
Comparison:	Dry Basis Reference Versus Dry Basis Source, 0 °C, 760 mm.Hg

RATA Run No.	Time		Load (MW)	RM flow (10 ³ x Nm ³ /hr)	CEM flow (10 ³ x Nm ³ /hr)	Difference (10 ³ x Nm ³ /hr)
	Start	End				
1	9.00	9.15	225	1,512.09	1,341.06	171.03
2	9.16	9.30	225	1,512.04	1,340.11	171.93
3	9.31	9.45	225	1,526.94	1,339.71	187.23
4	9.46	10.00	225	1,526.96	1,337.47	189.49
5	10.01	10.15	225	1,517.99	1,341.29	176.70
6	10.16	10.30	225	1,518.07	1,339.91	178.16
7	10.31	10.45	225	1,522.02	1,339.14	182.88
8	10.46	11.00	225	1,524.89	1,341.78	183.11
9	11.01	11.15	225	1,524.05	1,341.85	182.20
10	11.16	11.30	225	1,524.05	1,334.40	189.65
11	11.31	11.45	225	1,520.08	1,319.99	200.09
12	11.46	12.00	225	1,520.01	1,282.85	237.16
Average			225	1,520.77	1,333.30	187.47
			Confidence Coefficient:			12.94
			Relative Accuracy (%):			13.18
			Performance Specification (%RA):			20% ^{*/}

^{*/} 20% of RM value

Audited by : Natachadol Yimsoad
Engineer

Approved by : Buntoon Intim
Scientist : ๖-065-๓-6223

Relative Accuracy Determination for CEMS: North Bangkok Combined Cycle Power Plant Unit 11

Plant:	North Bangkok Combined Cycle Power Plant
Source Identification:	NB-C11
Date:	11 January 2024

RATA Run No.	Time		Load (MW)	SO ₂ ^{1/}			NO _x ^{1/}			O ₂ ^{2/}		
	Start	End		Instrumental RM	CEMS	Difference	Instrumental RM	CEMS	Difference	Instrumental RM	CEMS	Difference
1	8:01	8:30	225	0.9	0.5	0.4	44.4	42.5	1.9	12.9	13.2	-0.3
2	8:31	9:00	225	0.9	0.4	0.5	44.6	42.8	1.8	12.9	13.2	-0.3
3	9:01	9:30	225	0.9	0.7	0.2	44.5	44.0	0.5	12.9	13.2	-0.3
4	9:31	10:00	225	0.8	0.7	0.1	44.7	42.7	2.0	12.9	13.2	-0.3
5	10:01	10:30	225	0.9	0.9	0.0	44.6	41.6	3.0	12.9	13.2	-0.3
6	10:31	11:00	225	0.8	0.8	0.0	44.8	40.5	4.3	12.9	13.3	-0.4
7	11:01	11:30	225	0.9	0.8	0.1	44.7	41.7	3.0	12.9	13.3	-0.4
8	11:31	12:00	225	0.9	0.9	0.0	44.9	43.0	1.9	13.0	13.3	-0.3
9	12:01	12:30	225	0.9	0.8	0.1	44.8	43.7	1.1	13.0	13.4	-0.4
10	12:31	13:00	225	0.9	0.8	0.1	44.8	44.2	0.6	13.0	13.4	-0.4
11	13:01	13:30	225	0.9	0.7	0.2	44.9	43.9	1.0	13.0	13.4	-0.4
12	13:31	14:00	225	0.8	0.7	0.1	44.7	44.6	0.1	13.0	13.4	-0.4
Average:			225	0.9	0.7	0.2	44.7	42.9	1.8	12.9	13.3	-0.4
Confidence Coefficient:				0.1			0.8			-		
Relative Accuracy (%):				1.2			2.1			0.4		
Performance Specification (%RA):				≤ 10% ^{3/}			≤ 10% ^{3/}			≤ 1% ^{4/}		

^{1/} comparison on a consistent basis (dry and 7% oxygen)

^{2/} comparison on a consistent basis (dry and actual oxygen)

^{3/} 10% of emission standard (SO₂ = 20 ppmvd@7% O₂, NO_x = 120 ppmvd@7%O₂)

^{4/} 1% of Oxygen (RM value)

^{5/} 20% of RM value

Audited by : Natachadol Yimsoad
Engineer

Approved by : Buntoon Intim
Scientist : ๖-065-๙-6223

Relative Accuracy Determination for CEMS: North Bangkok Combined Cycle Power Plant Unit 12

Plant:	North Bangkok Combined Cycle Power Plant
Source Identification:	NB-C12
Date:	16 January 2024
Comparison:	Dry Basis Reference Versus Dry Basis Source, 0 °C, 760 mm.Hg

RATA Run No.	Time		Load (MW)	RM flow (10 ³ x Nm ³ /hr)	CEM flow (10 ³ x Nm ³ /hr)	Difference (10 ³ x Nm ³ /hr)
	Start	End				
1	9.00	9.15	228	1,609.47	1,370.26	239.21
2	9.16	9.30	228	1,604.79	1,360.97	243.82
3	9.31	9.45	228	1,607.81	1,354.13	253.68
4	9.46	10.00	228	1,605.78	1,346.23	259.55
5	10.01	10.15	228	1,606.93	1,349.14	257.79
6	10.16	10.30	228	1,610.73	1,342.27	268.46
7	10.31	10.45	228	1,607.77	1,346.98	260.79
8	10.46	11.00	228	1,611.73	1,317.94	293.79
9	11.01	11.15	228	1,608.38	1,324.87	283.51
10	11.16	11.30	228	1,606.14	1,340.58	265.56
11	11.31	11.45	228	1,604.42	1,335.74	268.68
12	11.46	12.00	228	1,606.70	1,318.81	287.89
Average			228	1,607.55	1,342.33	265.22
			Confidence Coefficient:			12.24
			Relative Accuracy (%):			17.26
			Performance Specification (%RA):			20% ^{*/}

*/ 20% of RM value

Audited by : Natachadol Yimsoad
Engineer

Approved by : Buntoon Intim
Scientist : ๖-065-๓-6223

Relative Accuracy Determination for CEMS: North Bangkok Combined Cycle Power Plant Unit 12

Plant:	North Bangkok Combined Cycle Power Plant
Source Identification:	NB-C12
Date:	16 January 2024

RATA Run No.	Time		Load (MW)	SO ₂ ^{1/}			NO _x ^{1/}			O ₂ ^{2/}		
	Start	End		Instrumental RM	CEMS	Difference	Instrumental RM	CEMS	Difference	Instrumental RM	CEMS	Difference
1	8:01	8:30	228	0.7	0.5	0.2	40.5	36.6	3.9	13.0	13.3	-0.3
2	8:31	9:00	228	0.7	0.5	0.2	40.5	36.4	4.1	13.0	13.3	-0.3
3	9:01	9:30	228	0.8	0.5	0.3	40.2	36.2	4.0	13.0	13.2	-0.2
4	9:31	10:00	228	0.7	0.5	0.2	40.1	36.3	3.8	13.0	13.2	-0.2
5	10:01	10:30	228	0.7	0.5	0.2	40.1	36.3	3.8	13.0	13.2	-0.2
6	10:31	11:00	228	0.8	0.6	0.2	40.0	36.3	3.7	13.0	13.2	-0.2
7	11:01	11:30	228	0.8	0.6	0.2	39.9	36.3	3.6	13.0	13.3	-0.3
8	11:31	12:00	228	0.8	0.5	0.3	40.0	36.4	3.6	13.0	13.3	-0.3
9	12:01	12:30	228	0.8	0.6	0.2	40.0	36.4	3.6	13.0	13.3	-0.3
10	12:31	13:00	228	0.7	0.5	0.2	39.9	35.9	4.0	13.0	13.3	-0.3
11	13:01	13:30	228	0.9	0.5	0.4	39.7	36.0	3.7	13.0	13.3	-0.3
12	13:31	14:00	228	0.7	0.5	0.2	39.7	36.0	3.7	13.0	13.3	-0.3
Average:			228	0.8	0.5	0.3	40.1	36.3	3.8	13.0	13.3	-0.3
Confidence Coefficient:				0.0			0.1			-		
Relative Accuracy (%):				1.5			3.3			0.3		
Performance Specification (%RA):				≤ 10% ^{3/}			≤ 10% ^{3/}			≤ 1% ^{4/}		

^{1/} comparison on a consistent basis (dry and 7% oxygen)

^{2/} comparison on a consistent basis (dry and actual oxygen)

^{3/} 10% of emission standard (SO₂ = 20 ppmvd@7% O₂, NO_x = 120 ppmvd@7%O₂)

^{4/} 1% of Oxygen (RM value)

^{5/} 20% of RM value

Audited by : Natachadol Yimsoad
Engineer

Approved by : Buntoon Intim
Scientist : ๖-065-๙-6223

Relative Accuracy Determination for CEMS : North Bangkok Combined Cycle Power Plant Unit 21

Plant:	North Bangkok Combined Cycle Power Plant
Source Identification:	NB-C21
Date:	18 January 2024
Comparison:	Dry Basis Reference Versus Dry Basis Source, 25 °C, 760 mm.Hg

RATA Run No.	Time		Load (MW)	RM flow (10 ³ x Nm ³ /hr)	CEM flow (10 ³ x Nm ³ /hr)	Difference (10 ³ x Nm ³ /hr)
	Start	End				
1	9.00	9.15	428	1,806.67	1,741.90	64.77
2	9.16	9.30	428	1,806.63	1,741.58	65.05
3	9.31	9.45	428	1,800.04	1,742.67	57.37
4	9.46	10.00	428	1,800.08	1,736.06	64.02
5	10.01	10.15	428	1,800.36	1,741.04	59.32
6	10.16	10.30	428	1,800.32	1,738.08	62.24
7	10.31	10.45	428	1,785.15	1,736.06	49.09
8	10.46	11.00	428	1,788.78	1,733.35	55.43
9	11.01	11.15	428	1,781.82	1,731.62	50.20
10	11.16	11.30	428	1,781.78	1,728.32	53.46
11	11.31	11.45	428	1,784.42	1,732.37	52.05
12	11.46	12.00	428	1,784.47	1,728.70	55.77
Average			428	1,793.38	1,735.98	57.40
			Confidence Coefficient:			4.17
			Relative Accuracy (%):			3.43
			Performance Specification (%RA):			20% ^{*/}

^{*/} 20% of RM value

Audited by : Natachadol Yimsoad
Engineer

Approved by : Buntoon Intim
Scientist : ๖-065-๙-6223

Relative Accuracy Determination for CEMS: Norht Bangkok Power Plant #Combined Cycle Plant Unit 21

Plant:	Norht Bangkok Power Plant
Source Identification:	NB-C21
Date:	18 January 2024

RATA Run No.	Time		Load (MW)	SO ₂ ^{1/}			NO _x ^{1/}			CO ^{1/}			O ₂ ^{2/}		
	Start	End		Instrumental RM	CEMS	Difference	Instrumental RM	CEMS	Difference	Instrumental RM	CEMS	Difference	Instrumental RM	CEMS	Difference
				(ppmvd@7% O ₂)			(ppmvd@7% O ₂)			(ppmvd@7% O ₂)			(% dry)		
1	8:01	8:30	428	0.6	0.0	0.6	9.1	6.2	2.9	2.1	0.0	2.1	12.3	12.5	-0.2
2	8:31	9:00	428	0.6	0.0	0.6	9.2	6.4	2.8	2.1	0.0	2.1	12.4	12.5	-0.1
3	9:01	9:30	428	0.6	0.0	0.6	9.2	6.5	2.7	2.2	0.0	2.2	12.4	12.6	-0.2
4	9:31	10:00	428	0.6	0.0	0.6	9.2	6.3	2.9	2.2	0.0	2.2	12.4	12.6	-0.2
5	10:01	10:30	428	0.7	0.0	0.7	9.2	6.5	2.7	2.1	0.0	2.1	12.4	12.6	-0.2
6	10:31	11:00	428	0.6	0.0	0.6	9.1	6.3	2.8	2.1	0.0	2.1	12.4	12.6	-0.2
7	11:01	11:30	428	0.6	0.0	0.6	9.1	6.2	2.9	2.1	0.0	2.1	12.4	12.6	-0.2
8	11:31	12:00	428	0.7	0.0	0.7	9.0	6.2	2.8	2.1	0.0	2.1	12.4	12.6	-0.2
9	12:01	12:30	428	0.6	0.0	0.6	9.1	6.2	2.9	2.1	0.0	2.1	12.4	12.6	-0.2
10	12:31	13:00	428	0.6	0.0	0.6	9.1	6.5	2.6	2.1	0.0	2.1	12.4	12.6	-0.2
11	13:01	13:30	428	0.7	0.0	0.7	9.0	6.3	2.7	2.1	0.0	2.1	12.4	12.6	-0.2
12	13:31	14:00	428	0.7	0.0	0.7	9.1	6.3	2.8	2.3	0.0	2.3	12.4	12.6	-0.2
Average:			428	0.6	0.0	0.6	9.1	6.3	2.8	2.1	0.0	2.1	12.4	12.6	-0.2
Confidence Coefficient:				0.0			0.1			0.0			-		
Relative Accuracy (%):				3.3			2.4			0.3			0.2		
Performance Specification (%RA):				≤ 10% ^{3/}			≤ 10% ^{3/}			≤ 5% ^{4/}			≤ 1% ^{5/}		

^{1/} comparison on a consistant basis (dry and 7% oxygen)
^{2/} comparison on a consistant basis (dry and actual oxygen)
^{3/} 10% of emission standard (SO₂ = 20 ppmvd@7% O₂, NO_x = 120 ppmvd@7%O₂)
^{4/} 5% of emission standard (CO = 690 ppmvd@7%O₂)
^{5/} 1% of Oxygen (RM value)

Audited by : Natachadol Yimsoad
Engineer

Approved by : Buntoon Intim
Scientist : ๓-065-๙-6223

Relative Accuracy Determination for CEMS : North Bangkok Combined Cycle Power Plant Unit 22

Plant:	North Bangkok Combined Cycle Power Plant
Source Identification:	NB-C22
Date:	9 January 2024
Comparison:	Dry Basis Reference Versus Dry Basis Source, 25 °C, 760 mm.Hg

RATA Run No.	Time		Load (MW)	RM flow (10 ³ x Nm ³ /hr)	CEM flow (10 ³ x Nm ³ /hr)	Difference (10 ³ x Nm ³ /hr)
	Start	End				
1	9.00	9.15	421	1,811.87	1,794.70	17.17
2	9.16	9.30	421	1,811.87	1,801.53	10.34
3	9.31	9.45	421	1,794.94	1,799.13	-4.19
4	9.46	10.00	421	1,794.80	1,799.42	-4.62
5	10.01	10.15	421	1,796.86	1,785.88	10.98
6	10.16	10.30	421	1,796.90	1,789.60	7.30
7	10.31	10.45	421	1,787.63	1,780.24	7.39
8	10.46	11.00	421	1,790.33	1,777.15	13.18
9	11.01	11.15	421	1,794.83	1,783.18	11.65
10	11.16	11.30	421	1,794.87	1,780.12	14.75
11	11.31	11.45	421	1,791.35	1,780.87	10.48
12	11.46	12.00	421	1,791.26	1,777.96	13.30
Average			421	1,796.46	1,787.48	8.98
			Confidence Coefficient:			5.02
			Relative Accuracy (%):			0.78
			Performance Specification (%RA):			20% ^{*/}

^{*/} 20% of RM value

Audited by : Natachadol Yimsoad
Engineer

Approved by : Buntoon Intim
Scientist : ๓-065-๑-6223

Relative Accuracy Determination for CEMS: Norht Bangkok Power Plant #Combined Cycle Plant Unit 22

Plant:	Norht Bangkok Power Plant
Source Identification:	NB-C22
Date:	9 January 2024

RATA Run No.	Time		Load (MW)	SO ₂ ^{1/}			NO _x ^{1/}			CO ^{1/}			O ₂ ^{2/}		
	Start	End		Instrumental RM	CEMS	Difference	Instrumental RM	CEMS	Difference	Instrumental RM	CEMS	Difference	Instrumental RM	CEMS	Difference
				(ppmvd@7% O ₂)			(ppmvd@7% O ₂)			(ppmvd@7% O ₂)			(% dry)		
1	9:31	10:00	418	0.6	1.0	-0.4	7.9	10.1	-2.2	2.0	0.0	2.0	12.5	12.7	-0.2
2	10:01	10:30	418	0.7	1.3	-0.6	7.9	9.8	-1.9	2.1	0.0	2.1	12.5	12.7	-0.2
3	10:31	11:00	418	0.7	1.4	-0.7	7.8	9.4	-1.6	2.1	0.0	2.1	12.5	12.7	-0.2
4	11:01	11:30	418	0.7	1.6	-0.9	7.8	9.5	-1.7	2.1	0.0	2.1	12.5	12.7	-0.2
5	11:31	12:00	418	0.8	1.6	-0.8	7.7	9.3	-1.6	2.2	0.0	2.2	12.4	12.7	-0.3
6	12:01	12:30	418	0.8	1.7	-0.9	7.6	9.2	-1.6	2.1	0.0	2.1	12.4	12.7	-0.3
7	12:31	13:00	418	0.7	1.6	-0.9	7.5	8.9	-1.4	2.2	0.0	2.2	12.4	12.7	-0.3
8	13:01	13:30	418	0.8	1.6	-0.8	7.5	8.7	-1.2	2.2	0.0	2.2	12.4	12.7	-0.3
9	13:31	14:00	418	0.8	1.6	-0.8	7.5	8.5	-1.0	2.3	0.0	2.3	12.4	12.7	-0.3
10	14:01	14:30	418	0.8	1.7	-0.9	7.4	8.6	-1.2	2.2	0.0	2.2	12.4	12.6	-0.2
11	14:31	15:00	418	0.8	1.5	-0.7	7.4	8.9	-1.5	2.2	0.0	2.2	12.4	12.6	-0.2
12	15:01	15:30	418	0.7	1.4	-0.7	7.4	8.7	-1.3	2.2	0.0	2.2	12.4	12.6	-0.2
Average:			418	0.7	1.5	-0.8	7.6	9.1	-1.5	2.2	0.0	2.2	12.4	12.7	-0.3
Confidence Coefficient:				0.1			0.2			0.1			-		
Relative Accuracy (%):				4.3			1.4			0.3			0.3		
Performance Specification (%RA):				≤ 10% ^{3/}			≤ 10% ^{3/}			≤ 5% ^{4/}			≤ 1% ^{5/}		

^{1/} comparison on a consistant basis (dry and 7% oxygen)
^{2/} comparison on a consistant basis (dry and actual oxygen)
^{3/} 10% of emission standard (SO₂ = 20 ppmvd@7% O₂, NO_x = 120 ppmvd@7%O₂)
^{4/} 5% of emission standard (CO = 690 ppmvd@7%O₂)
^{5/} 1% of Oxygen (RM value)

Audited by : Natachadol Yimsoad
Engineer

Approved by : Buntoon Intim
Scientist : ๓-065-๙-6223

ผลการตรวจวัดคุณภาพอากาศจากปล่องแบบครั้งคราว (Stack Sampling)

Emission Test Results and Relative Standard Deviation (% RSD)

Parameter	Result	
	Sample 1	
	Train A	Train B
Plant	NB-C11	
Sampled Date	16 มกราคม 2567	
Sampled Time	11:00	13:05
Fuel	Natural Gas	
Load (MW)	228	
Stack Temperature (°C)	117	
Oxygen (%)	13.2	
Carbon dioxide (%)	4.3	
Sample Name	NB-C11_Ex.1A	NB-C11_Ex.1B
Moisture (%)	9.39	9.31
Flue Gas Velocity (m/s)	26.39	26.39
Fuel Gas Flow Rate (m ³ /hr) ^{1/}	1,719,235	1,718,807
Total Suspended Particulate Concentration(mg/dscm) ^{2/}	1.40	1.55
Emission Rate (g/s)	0.37	0.41
Average Concentration (mg/dscm) ^{2/}	1.47	
RSD (%) ^{3/}	5.16	
RSD Criteria (%) ^{4/}	24.21	
Valid/Invalid	Valid	

Remark:

^{1/} at Standard Pressure Actual O₂, 760 mmHg, 25°C, and dry basis

^{2/} at 7% O₂, Standard Pressure 760 mmHg, 25°C, and dry basis

^{3/} % RSD defined as

$$RSD = 100\% \times \frac{|(C_a - C_b)|}{(C_a + C_b)}$$

^{4/} Acceptance limit for persion of paired train is :

- RSD < 10 % ; Concentrations is > 10 mg/dscm
- RSD < 25 % ; Concentrations is ≤1 mg/dscm
- Concentrations between 1 mg/dscm and 10 mg/dscm the allowable RSD decreases linearly from 25% to 10%
or Determined Using Equation : $26.67 - (1.67 \times C_{avg})$

Emission Test Results and Relative Standard Deviation (% RSD)

Parameter	Result	
	Sample 1	
	Train A	Train B
Plant	NB-C12	
Sampled Date	12 มกราคม 2567	
Sampled Time	11:25	13:30
Fuel	Natural Gas	
Load (MW)	228	
Stack Temperature (°C)	113	
Oxygen (%)	13.2	
Carbon dioxide (%)	4.3	
Sample Name	NB-C12_Ex.1A	NB-C12_Ex.1B
Moisture (%)	9.67	9.90
Flue Gas Velocity (m/s)	26.93	26.94
Fuel Gas Flow Rate (m ³ /hr) ^{1/}	1,749,474	1,745,617
Total Suspended Particulate Concentration(mg/dscm) ^{2/}	1.07	1.29
Emission Rate (g/s)	0.29	0.35
Average Concentration (mg/dscm) ^{2/}	1.18	
RSD (%) ^{3/}	9.10	
RSD Criteria (%) ^{4/}	24.70	
Valid/Invalid	Valid	

Remark:

^{1/} at Standard Pressure Actual O₂, 760 mmHg, 25°C, and dry basis

^{2/} at 7% O₂, Standard Pressure 760 mmHg, 25°C, and dry basis

^{3/} % RSD defined as

$$RSD = 100\% \times \frac{|(C_a - C_b)|}{(C_a + C_b)}$$

^{4/} Acceptance limit for persion of paired train is :

- RSD < 10 % ; Concentrations is > 10 mg/dscm
- RSD < 25 % ; Concentrations is ≤1 mg/dscm
- Concentrations between 1 mg/dscm and 10 mg/dscm the allowable RSD decreases linearly from 25% to 10%
or Determined Using Equation : $26.67 - (1.67 \times C_{avg})$

Emission Test Results and Relative Standard Deviation (% RSD)

Parameter	Result	
	Sample 1	
	Train A	Train B
Plant	NB-C21	
Sampled Date	19 มกราคม 2567	
Sampled Time	11:10	13:15
Fuel	Natural Gas	
Load (MW)	424	
Stack Temperature (°C)	90	
Oxygen (%)	12.6	
Carbon dioxide (%)	4.6	
Sample Name	NB-C21_Ex.1A	NB-C21_Ex.1B
Moisture (%)	10.10	9.98
Flue Gas Velocity (m/s)	17.81	17.83
Fuel Gas Flow Rate (m ³ /hr) ^{1/}	1,795,663	1,800,989
Total Suspended Particulate Concentration(mg/dscm) ^{2/}	1.06	1.28
Emission Rate (g/s)	0.32	0.38
Average Concentration (mg/dscm) ^{2/}	1.17	
RSD (%) ^{3/}	9.26	
RSD Criteria (%) ^{4/}	24.71	
Valid/Invalid	Valid	

Remark:

^{1/} at Standard Pressure Actual O₂, 760 mmHg, 25°C, and dry basis

^{2/} at 7% O₂, Standard Pressure 760 mmHg, 25°C, and dry basis

^{3/} % RSD defined as

$$RSD = 100\% \times \frac{|(C_a - C_b)|}{(C_a + C_b)}$$

^{4/} Acceptance limit for persion of paired train is :

- RSD < 10 % ; Concentrations is > 10 mg/dscm
- RSD < 25 % ; Concentrations is ≤ 1 mg/dscm
- Concentrations between 1 mg/dscm and 10 mg/dscm the allowable RSD decreases linearly from 25% to 10%
or Determined Using Equation : $26.67 - (1.67 \times C_{avg})$

Emission Test Results and Relative Standard Deviation (% RSD)

Parameter	Result	
	Sample 1	
	Train A	Train B
Plant	NB-C22	
Sampled Date	10 มกราคม 2567	
Sampled Time	11:40	13:56
Fuel	Natural Gas	
Load (MW)	424	
Stack Temperature (°C)	92	
Oxygen (%)	12.6	
Carbon dioxide (%)	4.6	
Sample Name	NB-C22_Ex.1A	NB-C22_Ex.1B
Moisture (%)	10.15	10.16
Flue Gas Velocity (m/s)	18.40	18.40
Fuel Gas Flow Rate (m ³ /hr) ^{1/}	1,848,148	1,847,648
Total Suspended Particulate Concentration(mg/dscm) ^{2/}	1.16	1.19
Emission Rate (g/s)	0.36	0.36
Average Concentration (mg/dscm) ^{2/}	1.18	
RSD (%) ^{3/}	1.15	
RSD Criteria (%) ^{4/}	24.71	
Valid/Invalid	Valid	

Remark:

^{1/} at Standard Pressure Actual O₂, 760 mmHg, 25°C, and dry basis

^{2/} at 7% O₂, Standard Pressure 760 mmHg, 25°C, and dry basis

^{3/} % RSD defined as

$$RSD = 100\% \times \frac{|(C_a - C_b)|}{(C_a + C_b)}$$

^{4/} Acceptance limit for persion of paired train is :

- RSD < 10 % ; Concentrations is > 10 mg/dscm
- RSD < 25 % ; Concentrations is ≤ 1 mg/dscm
- Concentrations between 1 mg/dscm and 10 mg/dscm the allowable RSD decreases linearly from 25% to 10%
or Determined Using Equation : $26.67 - (1.67 \times C_{avg})$



CHEMICAL DIVISION ELECTRICITY GENERATING AUTHORITY OF THAILAND

81 Moo 11 Bangkrui-Sainoi Road, Sainoi, Nonthaburi 11150 Tel. 0-2436-6789 Ext.6720

ANALYSIS REPORT

PLANT: North Bangkok Power Plant RUN NO.: 1
ADDRESS: 53 Moo 2, Bangkrui, Bangkrui, Nonthaburi, 11130 SAMPLING DATE: 16/01/2567
UNIT: NB-C11 SAMPLING TIME: 11:00 - 13:05
SAMPLE TYPE: Flue gas from stack FLOW RATE: 1,718,807 m³/hr
FUEL TYPE: Natural gas LOAD: 228 MW
SAMPLING BY: Arnon Bhavaranphong (๓-312-๓-8990)

ITEMS	U.S. EPA METHOD 3A	U.S. EPA METHOD 7E	U.S. EPA METHOD 6C	U.S. EPA METHOD 10
	O ₂	NO _x	SO ₂	CO
Concentration	13.22	24.80	0.20	0.66
	%	ppmvd @ Actual O ₂	ppmvd @ Actual O ₂	ppmvd @ Actual O ₂
		44.91	<0.5	1.19
		ppmvd @ 7% O ₂	ppmvd @ 7% O ₂	ppmvd @ 7% O ₂
Control Limit	-	96.0	10.0	-
		ppmvd @ 7% O ₂	ppmvd @ 7% O ₂	
Emission Rate	-	22.28	<0.63	0.36
		g/s	g/s	g/s
Control Limit	-	46.0	6.7	-
		g/s	g/s	

REMARKS:

1. The above results are valid only for the analyzed sample (s) as indicated in this report.
2. Do not copy partial of this analysis report without official approval.

APPROVED BY

(Pornthep Kittayakasem)

๓-312-๓-8982

26/01/2567

Combustion Products and Wastewater Analysis Section,
Chemical Analysis Department, Chemical Division
Laboratory Number: ๓-312



CHEMICAL DIVISION ELECTRICITY GENERATING AUTHORITY OF THAILAND

81 Moo 11 Bangkrui-Sainoi Road, Sainoi, Nonthaburi 11150 Tel. 0-2436-6789 Ext.6720

ANALYSIS REPORT

PLANT: North Bangkok Power Plant RUN NO.: 2
ADDRESS: 53 Moo 2, Bangkrui, Bangkrui, Nonthaburi, 11130 SAMPLING DATE: 12/01/2567
UNIT: NB-C12 SAMPLING TIME: 13:51 - 15:55
SAMPLE TYPE: Flue gas from stack FLOW RATE: 1,703,365 m³/hr
FUEL TYPE: Natural gas LOAD: 228 MW
SAMPLING BY: Arnon Bhavaranphong (๓-312-๓-8990)

ITEMS	U.S. EPA METHOD 3A	U.S. EPA METHOD 7E	U.S. EPA METHOD 6C	U.S. EPA METHOD 10
	O ₂	NO _x	SO ₂	CO
Concentration	13.18	22.14	0.20	0.53
		ppmvd @ Actual O ₂	ppmvd @ Actual O ₂	ppmvd @ Actual O ₂
	%	39.90	<0.5	0.95
		ppmvd @ 7% O ₂	ppmvd @ 7% O ₂	ppmvd @ 7% O ₂
Control Limit	-	96.0	10.0	-
		ppmvd @ 7% O ₂	ppmvd @ 7% O ₂	
Emission Rate	-	19.72	<0.62	0.29
		g/s	g/s	g/s
Control Limit	-	46.0	6.7	-
		g/s	g/s	

REMARKS:

1. The above results are valid only for the analyzed sample (s) as indicated in this report.
2. Do not copy partial of this analysis report without official approval.

APPROVED BY

(Pornthep Kittayakasem)

๓-312-๓-8982

26/01/2567

Combustion Products and Wastewater Analysis Section,
Chemical Analysis Department, Chemical Division
Laboratory Number: ๓-312



CHEMICAL DIVISION ELECTRICITY GENERATING AUTHORITY OF THAILAND

81 Moo 11 Bangkrui-Sainoi Road, Sainoi, Nonthaburi 11150 Tel. 0-2436-6789 Ext.6720

ANALYSIS REPORT

PLANT: North Bangkok Power Plant RUN NO.: 1
ADDRESS: 53 Moo 2, Bangkrui, Bangkrui, Nonthaburi, 11130 SAMPLING DATE: 19/01/2567
UNIT: NB-C21 SAMPLING TIME: 11:10 - 13:15
SAMPLE TYPE: Flue gas from stack FLOW RATE: 1,800,989 m³/hr
FUEL TYPE: Natural gas LOAD: 424 MW
SAMPLING BY: Arnon Bhavaranphong (๓-312-๓-8990)

ITEMS	U.S. EPA METHOD 3A	U.S. EPA METHOD 7E	U.S. EPA METHOD 6C	U.S. EPA METHOD 10
	O ₂	NO _x	SO ₂	CO
Concentration	12.61	5.04	<0.12	1.04
	%	ppmvd @ Actual O ₂	ppmvd @ Actual O ₂	ppmvd @ Actual O ₂
		8.45	<0.5	1.74
		ppmvd @ 7% O ₂	ppmvd @ 7% O ₂	ppmvd @ 7% O ₂
Control Limit	-	70.0	10.0	-
		ppmvd @ 7% O ₂	ppmvd @ 7% O ₂	
Emission Rate	-	4.74	<0.66	0.59
		g/s	g/s	g/s
Control Limit	-	43.6	8.7	-
		g/s	g/s	

REMARKS:

1. The above results are valid only for the analyzed sample (s) as indicated in this report.
2. Do not copy partial of this analysis report without official approval.

APPROVED BY

(Pornthep Kittayakasem)

๓-312-๓-8982

26/01/2567

Combustion Products and Wastewater Analysis Section,
Chemical Analysis Department, Chemical Division
Laboratory Number: ๓-312



CHEMICAL DIVISION ELECTRICITY GENERATING AUTHORITY OF THAILAND

81 Moo 11 Bangkrui-Sainoi Road, Sainoi, Nonthaburi 11150 Tel. 0-2436-6789 Ext.6720

ANALYSIS REPORT

PLANT: North Bangkok Power Plant RUN NO.: 1
ADDRESS: 53 Moo 2, Bangkrui, Bangkrui, Nonthaburi, 11130 SAMPLING DATE: 10/01/2567
UNIT: NB-C22 SAMPLING TIME: 11:40 - 13:56
SAMPLE TYPE: Flue gas from stack FLOW RATE: 1,848,148 m³/hr
FUEL TYPE: Natural gas LOAD: 424 MW
SAMPLING BY: Arnon Bhavaranphong (๓-312-๓-8990)

ITEMS	U.S. EPA METHOD 3A	U.S. EPA METHOD 7E	U.S. EPA METHOD 6C	U.S. EPA METHOD 10
	O ₂	NO _x	SO ₂	CO
Concentration	12.59	4.21	0.15	1.52
	%	ppmvd @ Actual O ₂	ppmvd @ Actual O ₂	ppmvd @ Actual O ₂
		7.05	<0.5	2.54
		ppmvd @ 7% O ₂	ppmvd @ 7% O ₂	ppmvd @ 7% O ₂
Control Limit	-	70.0	10.0	-
		ppmvd @ 7% O ₂	ppmvd @ 7% O ₂	
Emission Rate	-	4.07	<0.67	0.89
		g/s	g/s	g/s
Control Limit	-	43.6	8.7	-
		g/s	g/s	

REMARKS:

1. The above results are valid only for the analyzed sample (s) as indicated in this report.
2. Do not copy partial of this analysis report without official approval.

APPROVED BY

(Pornthep Kittayakasem)

๓-312-๓-8982

26/01/2567

Combustion Products and Wastewater Analysis Section,
Chemical Analysis Department, Chemical Division
Laboratory Number: ๓-312