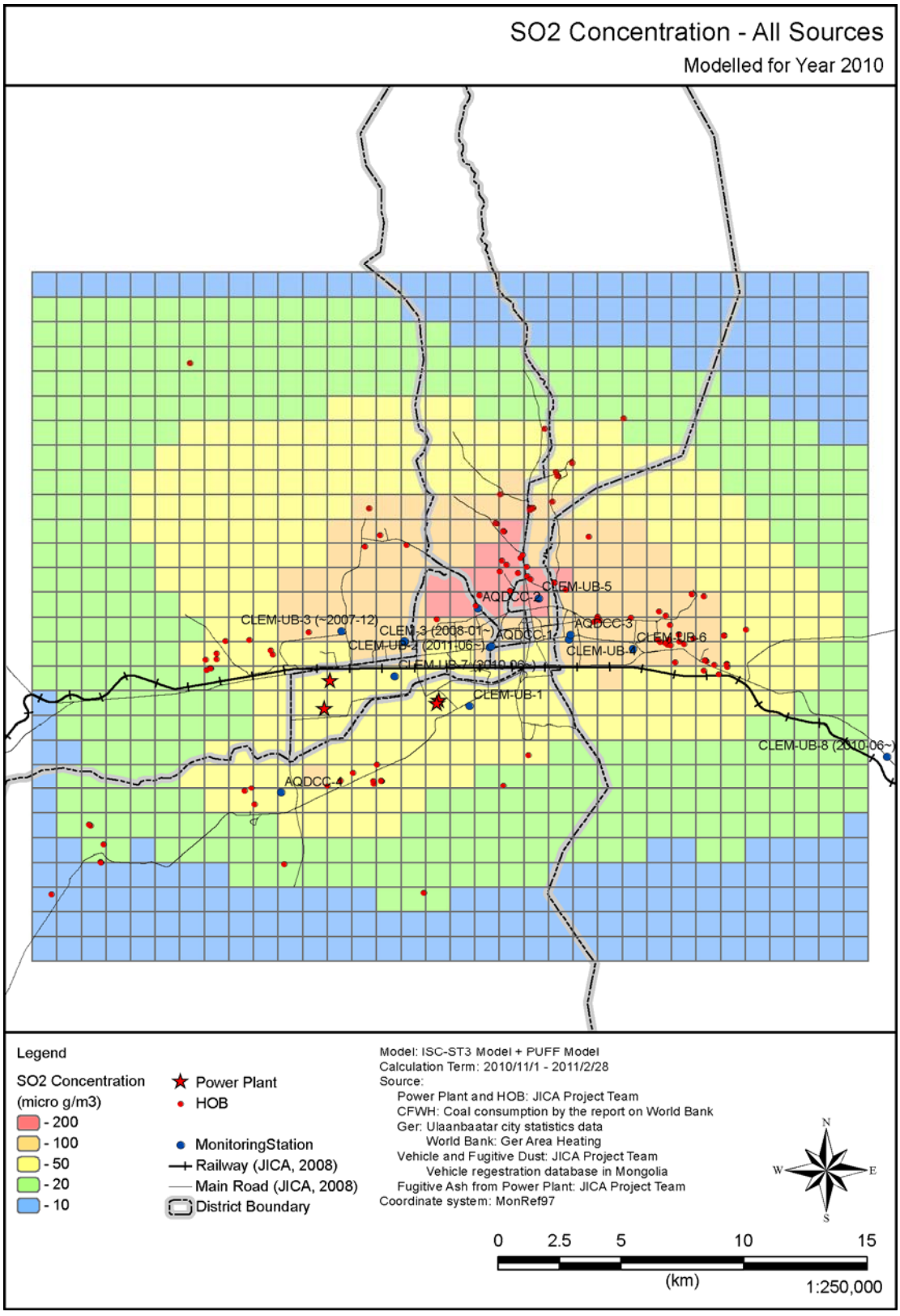
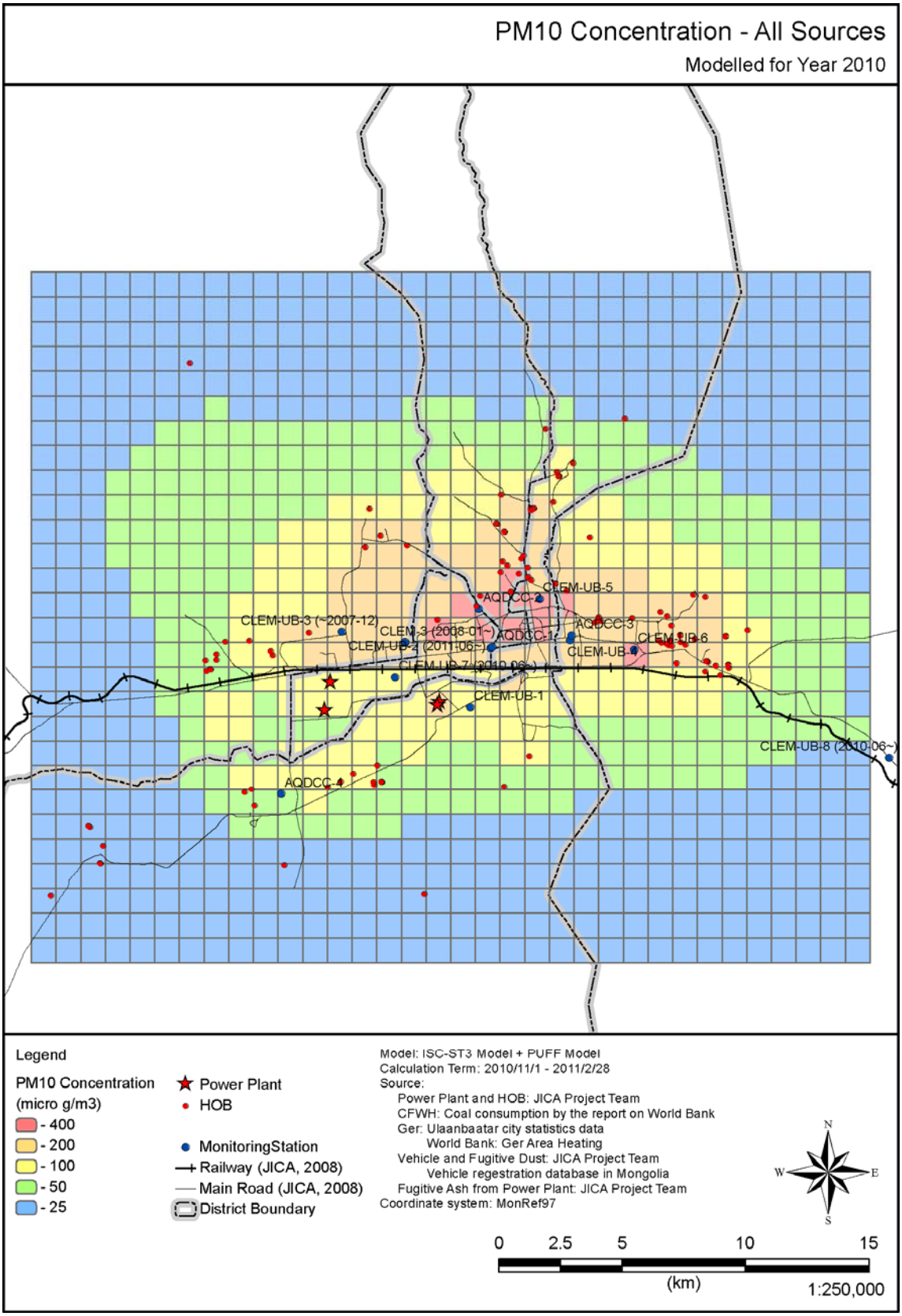
Хавсралт2.1-14 Жил бүрийн тархалтын загварчлалын дүн

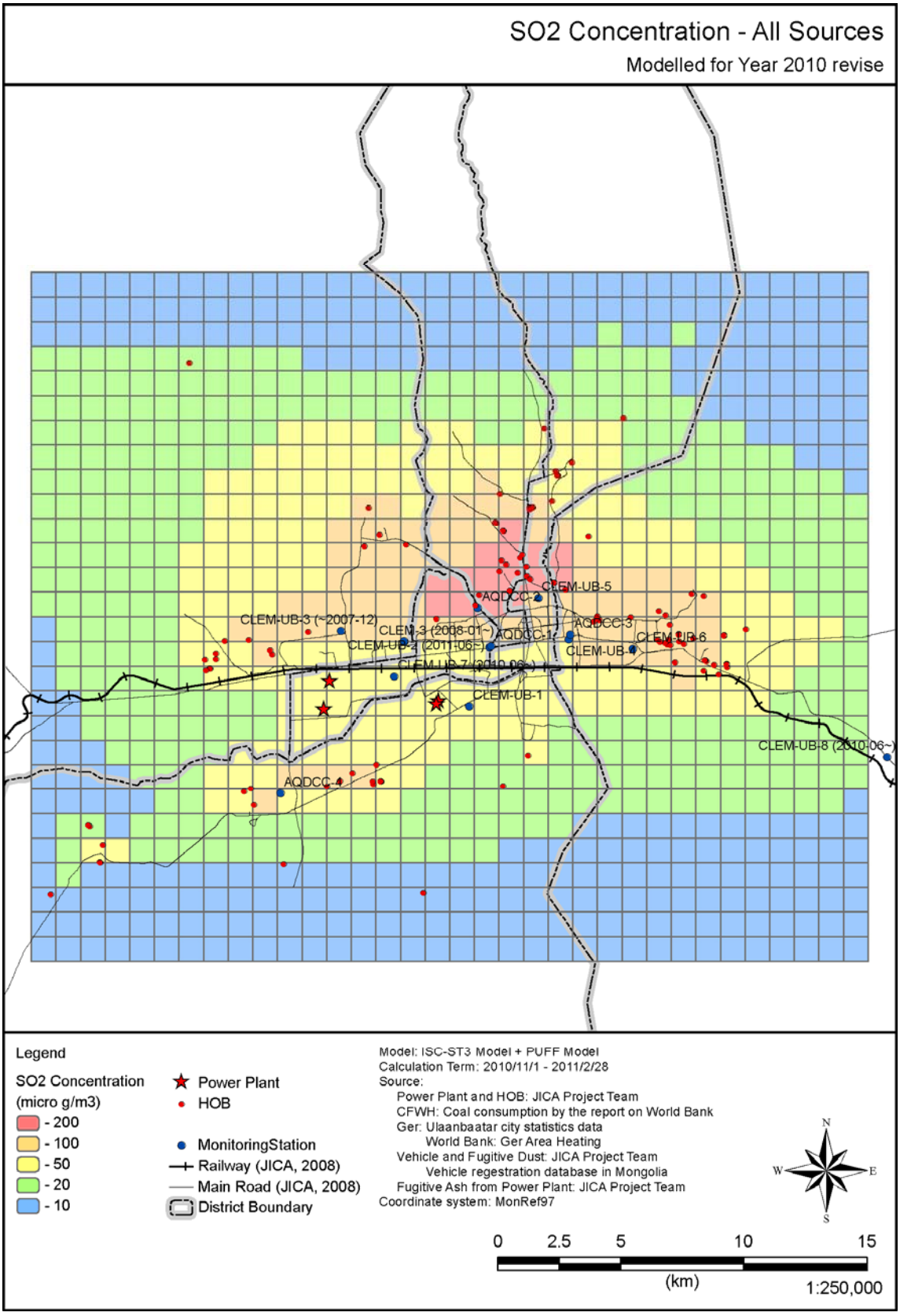
1 Тархалтын загварчлалын дүнгийн агуулламжийн байршилийн зураг



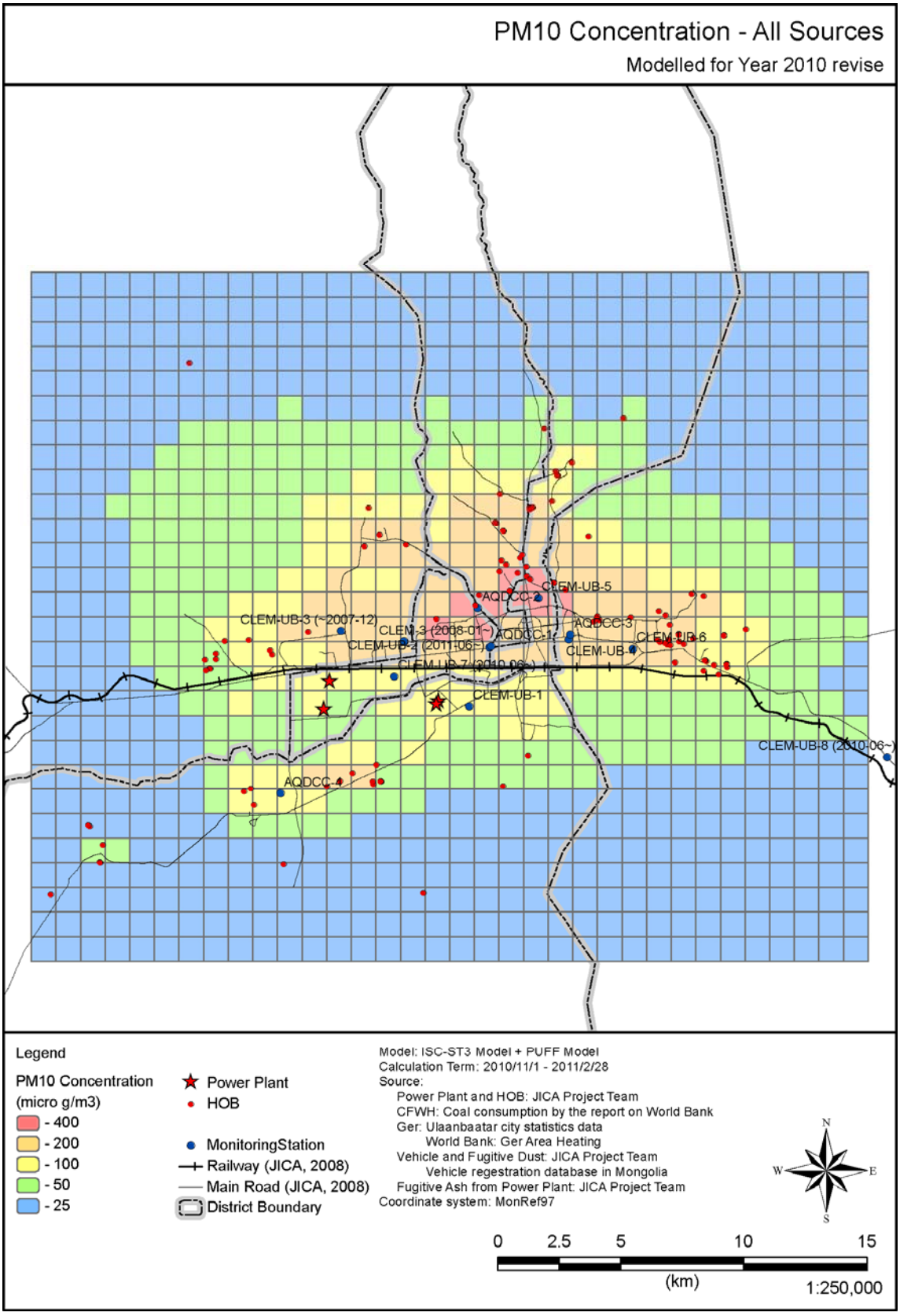
Зураг 1-1 SO_2- ын тархалтын загварчлалын дүн (2010 он, Мэргэжилтний дүгнэлт)



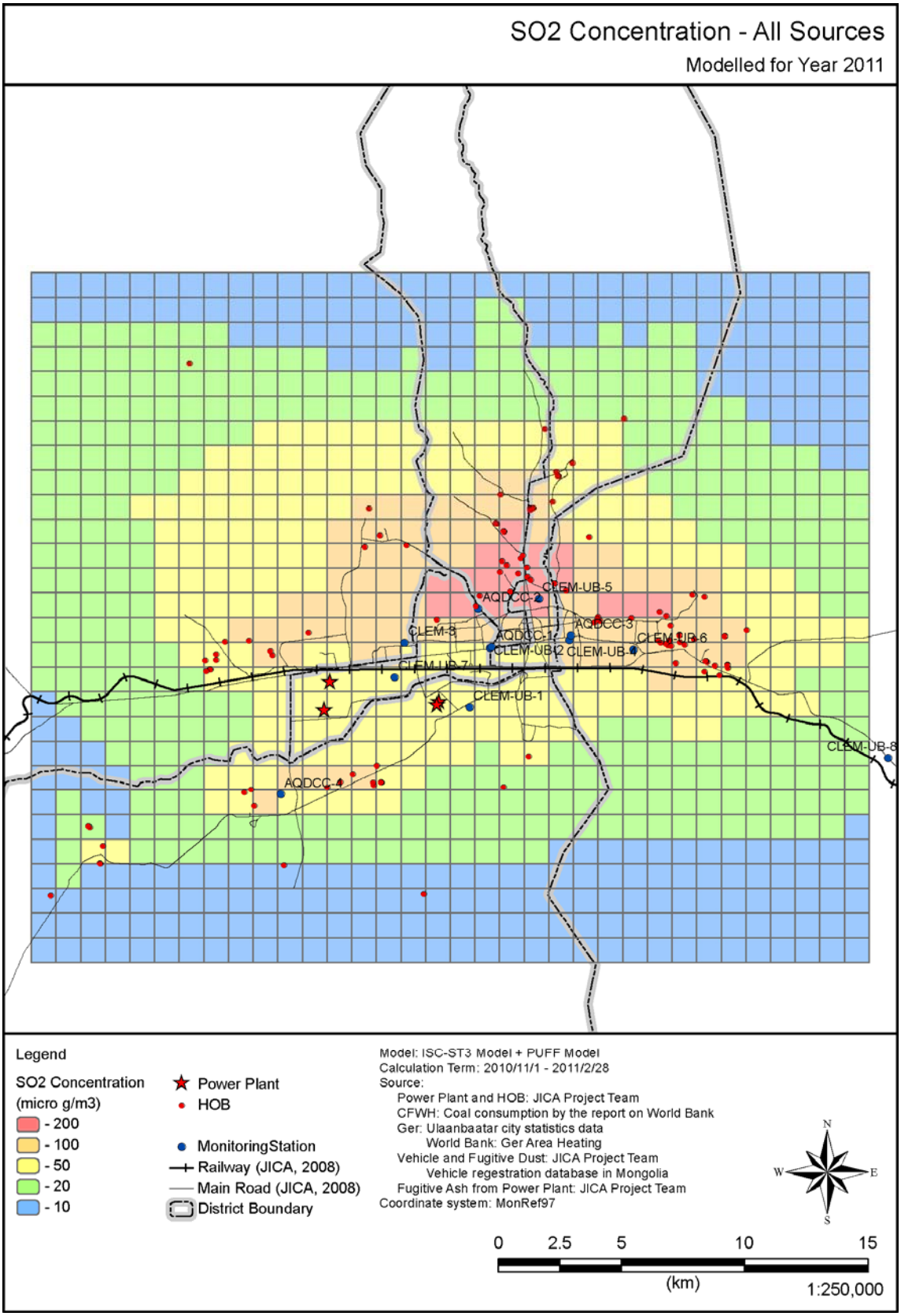
Зураг 1-2 PM_{10}-ын тархалтын загварчлалын дүн (2010 он, Мэргэжилтний дүгнэлт)



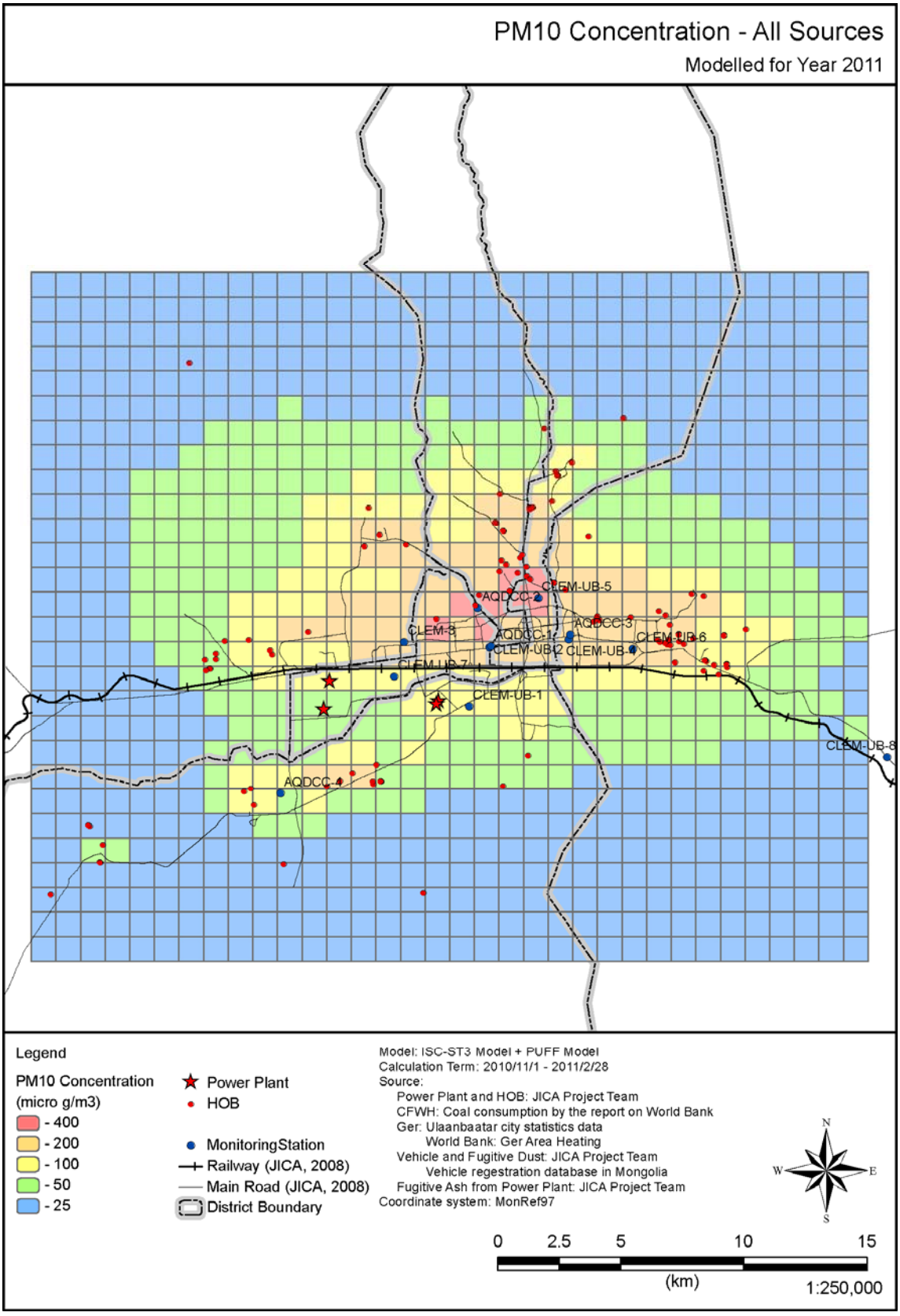
Зураг 1-3 SO_2- ын тархалтын загварчлалын дүн (2010 оны шинэчилсэн хувилбар)



Зураг 1-4 PM_{10}-ын тархалтын загварчлалын дүн (2010 оны шинэчилсэн хувилбар)



Зураг 1-5 SO_2- ын тархалтын загварчлалын дүн (2011 он)



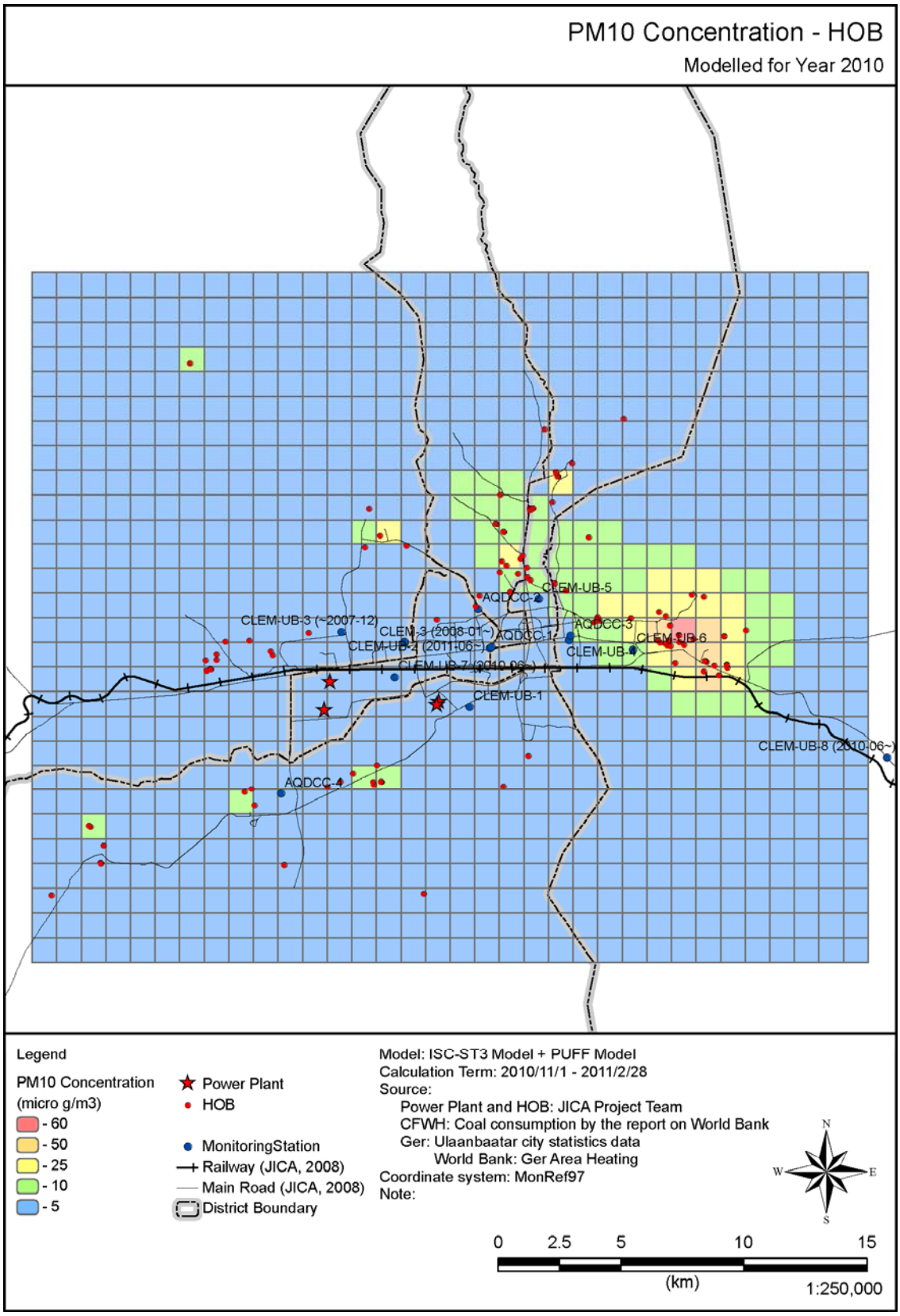
Зураг 1-6 PM_{10}-ын тархалтын загварчлалын дүн (2011 он)

2 Тархалтын загварчлалын дүнгийн үнэлгээ

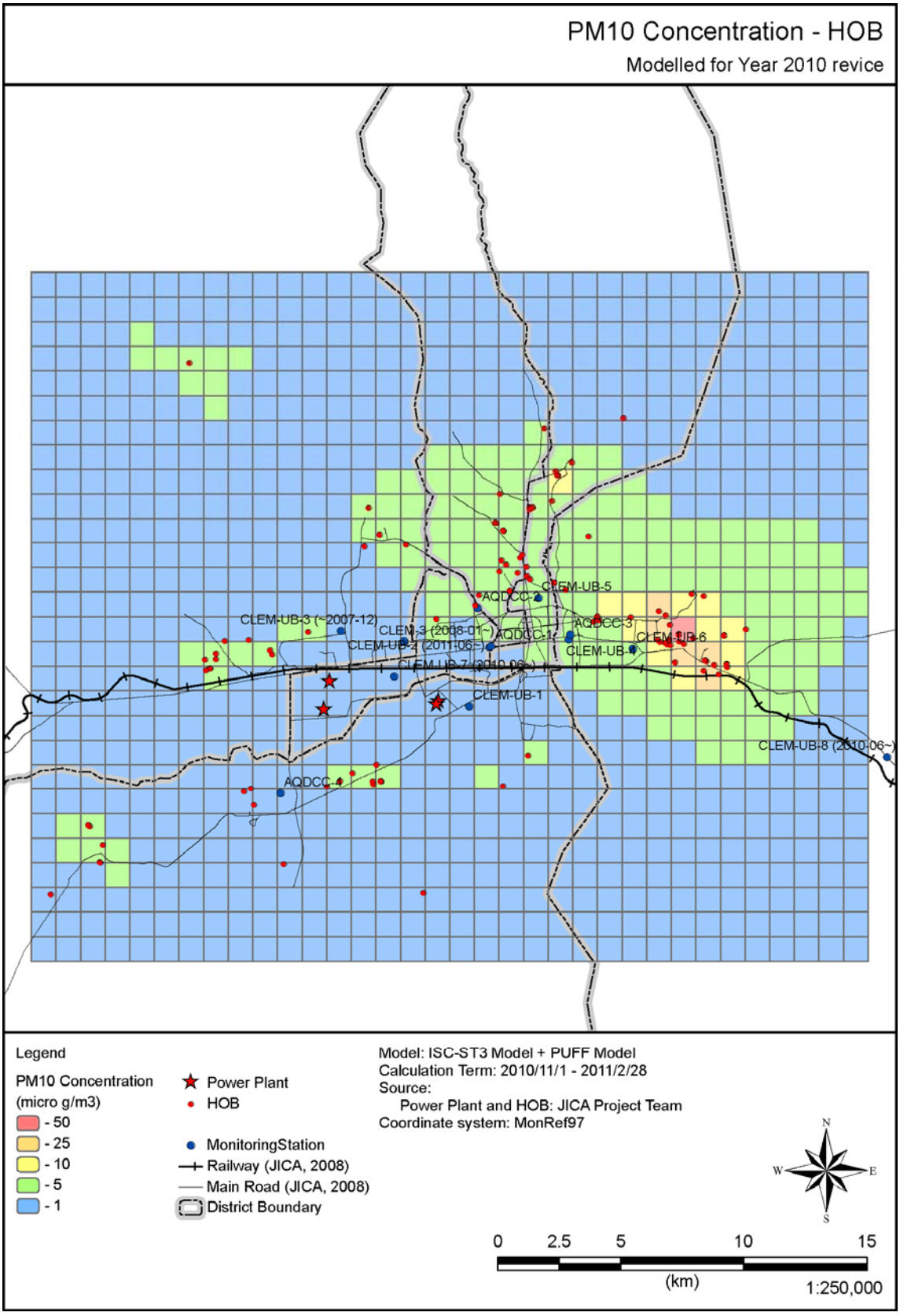
Хүснэгт 2-1 Орчны стандарт болон тархалтын загварчлалын харьцуулсан дүн

Хамрах бодис	Хамрах он	Бүтэн жилийн орчны стандартаас хэтэрсэн гридын тоо /Нийт тооцооллын гридын тоо (хэтэрсэн хувь)	Өдрийн дундаж орчны стандартаас хэтэрсэн гридын тоо / Нийт тооцооллын гридын тоо (хэтэрсэн хувь)
SO_2	2010 он	724/952 (76.05%)	359/952 (37.71%)
	2010 оны шинэчилсэн хувилбар	624/952 (65.55%)	290/952 (30.46%)
	2011 он	670/952 (70.38%)	322/952 (33.82%)
NO_2	2010 он	164/952 (17.23%)	105/952 (11.03%)
	2010 оны шинэчилсэн хувилбар	72/952 (7.56%)	34/952 (3.57%)
	2011 он	57/952 (5.99%)	26/952 (2.73%)

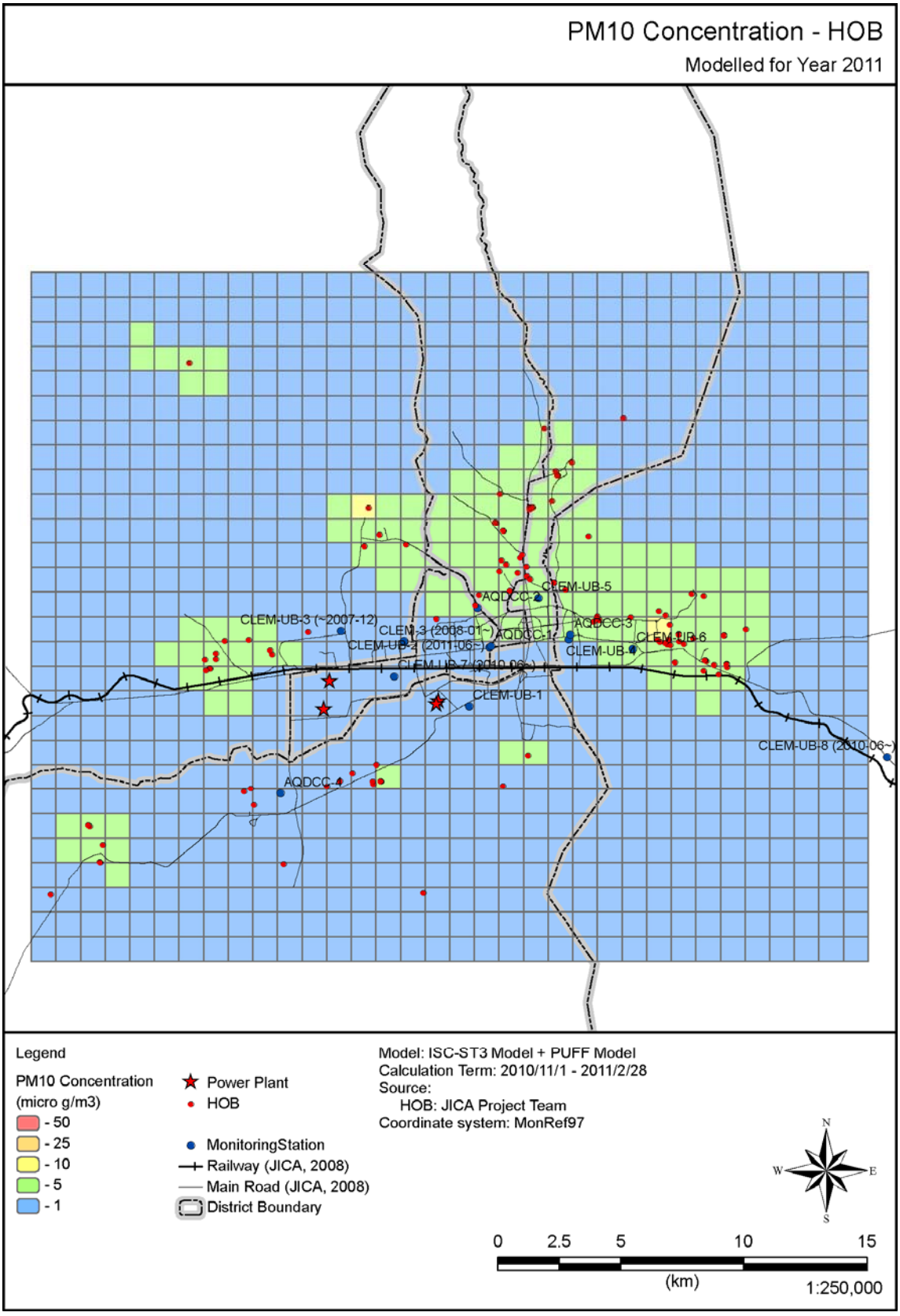
Хавсралт2.1-15 УХЗ ны тархалтын загварчлалын дүн



Зураг 1 УХЗ-ны тархалтын загварчлалын дүн (PM_{10}, 2010 он, мэргэжилтний дүгнэлт)



Зураг 2 УХЗ-ны тархалтын загварчлалын дүн (PM_{10}, 2010 оны шинэчилсэн хувилбар)



Зураг 3 УХЗ-ны тархалтын загварчлалын дүн (PM_{10}, 2011 он)

Хавсралт2.2-1 Утааны хийн сургалтын материал

Хэмжилтийн байршил болон хэмжилтийн цэг

(1) Хэмжилтийн байршилыг тогтох

Цооногын нумарсан хэсэг, огтлолцсон хэсгийн гэнэтийн өөрчлөлтийн хэсгээс зайлсхийж хаягдал газын урсгалын харьцангуй ижил төвшинд урсаж , хэмжилтийн үйл ажиллагаа аюулгүй дээр хялбар явагдах газрын сонгоно.

Цооногын огтлолцол, хэлбэр түүний том жижигт таарсан тооны ижил огтлолцолыг хийн огтлолцол тус бүрт хэмжилтийн цэгийг тогтооно.

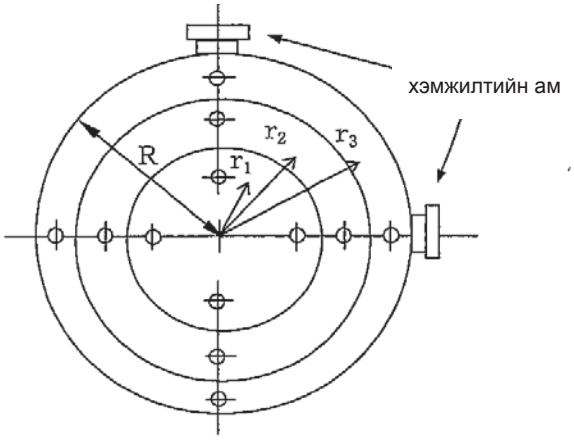
Цилиндер хэлбэртэй огтлолцолын хэмжилтийн дүн

Таарах цооногын диматер	Диаметрийн хувиарлалтын тоо	Хэмжилтийн дүн	Цооногын гол хэсгээс хэмжилтийн цэг хүртэлх зай				
			R1	R2	R3	R4	R5
1-ээс доош	1	4	0.707R	-	-	-	-
1-ээс дээш 2-оос доош	2	8	0.500R	0.866R	-	-	-
2-оос дээш буюу 4-өөс доош	3	12	0.408R	0.707R	0.913R	-	-
4-өөс дээш буюу 4.5-аас доош	4	16	0.354R	0.612R	0.791R	0.935R	-
4.5-аас дээш тохиолдолд	5	20	0.316R	0.548R	0.707R	0.837R	0.949R

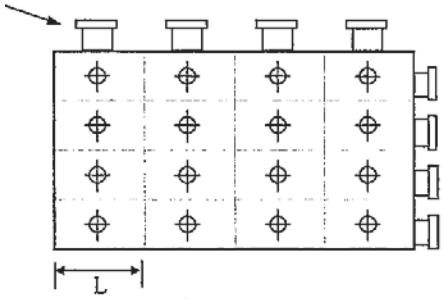
Тэгш өнцөгт квадратын огтлолцолын хэмжилтийн дүн

	Хуваагдсан нэг талын урт
1-ээс доош	L≦0.5
1-ээс дээш 4-өөс доош	L≦0.667
4-өөс дээш 20-оос доош	L≦1

Цилиндер хэлбэрийн огтлолцолын талбай



Тэгш өнцөгтийн огтлолцолын хэмжилтийн дүн



Хаягдал газанд агуулагдах тоосны нягтширалд хэмжилт хийх арга(JIS Z 8808)

Ижил хурдтай соролтыг тохируулах(Энгийн хэлбэрийн дээж авах төхөөрөмжийг ашиглах арга)

$$\chi_w = \frac{\frac{22.4}{18} m_a}{V_m \times \frac{273}{273+\theta_m} \times \frac{P_a + P_m - P_v}{101.3} + \frac{22.4}{18} m_a} \times 100$$

Vm: Сорох газын хэмжээ
Θm: Газын тоолуурын хэм
Ma: Нийт соргдсон чийгшилийн хэмжээ
Pa: Агаарын даралт(kPa)
Pm: Газын тоолуурын даралт(kPa)
Pv: Θm Дүүрэн усны ууршилтын даралт(kPa)

$$\rho_0 = \frac{1}{22.4 \times 100}\left[\left\{44 \times CO_2 + 32 \times O_2 + 28(CO + N_2)\right\}\left(1 - \frac{\chi_w}{100}\right) + 18 \times \chi_w\right]$$

$$\rho = \rho_0 \times \frac{273}{273+\theta_s} \times \frac{P_a + P_s}{101.3}$$

$$v = c\sqrt{\frac{2P_d}{\rho}}$$

$$Q_N = A \times v \times \frac{273}{273+\theta_s} \times \frac{P_a + P_s}{101.3} \times 60 \times 60$$

$$Q'_N = Q_N\left(1 - \frac{\chi_w}{100}\right)$$

$$qm = \frac{\pi}{4} d^2 \left(1 - \frac{\chi w}{100}\right) \frac{273+\theta m}{273+\theta s} \times \frac{Pa+Ps}{Pa+Pm-Pv} \times v \times 60 \times 10^{-3}$$

P: Газын нягтрал (kg/Nm³)
P0: Газын нягтрал(kg/Nm³)
Ps: нам даралтДинамик даралт(kPa)
Pd: Динамик даралт(Pa)
QN: Чийглэг газын хэмжээ(Nm³/h)
A: Цооногын огтлолцолын эзэлхүүн(m²)
V: Урсгалын хурд(m/s)
Q'N: Хуурай газын хэмжээ(Nm³/h)
Xw: Чийгшилийн хэмжээ(%)
Θs: Хаягдал газын хэм(℃)
C:Питогийн хоолойн (Pitot tube) коэфицент
Qm: Ижил хурдтай соролтын хэмжээ(L/min)
D: Хошууны радиус(mm)

Хаягдал газанд агуулагдах тоосны нягтширалд хэмжилт хийх арга(JIS Z 8808)

Чийгшилийн хэмжилт (чийг сорох хоолойн арга)

←Хоолойн чийг сорох ажиллагааг 2давтан хийнэ.

←n=2-т дээж авна.

←Газын тоолуурын хэмжилтийн өөрчлөлтийг харах (хэмжилтийн өмнө,хойно)

←Газын тоолуурын хэм харах

←Дээж сорох хурд 1л/мин-2л/мин

Дээж сорох хэмжээ 5л-10л

Тооцоолох арга

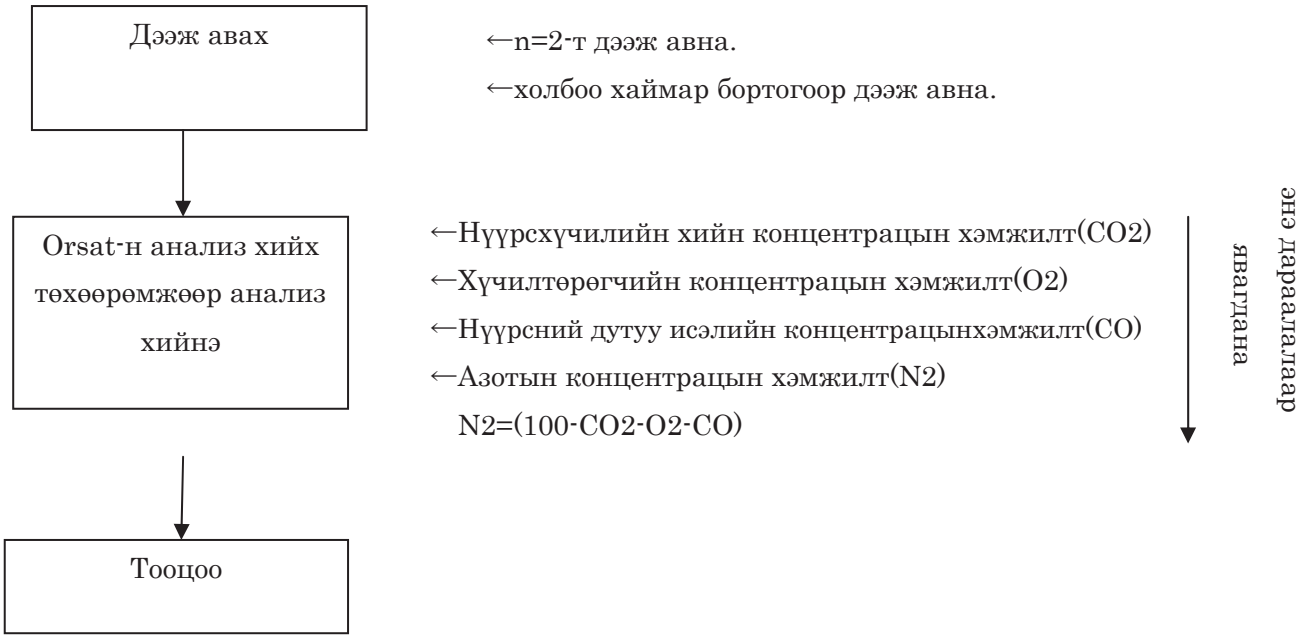
$$\chi_w = \frac{\frac{22.4}{18} m_a}{V_m \times \frac{273}{273+\theta_m} \times \frac{P_a + P_m - P_v}{101.3} + \frac{22.4}{18} m_a} \times 100$$

Vm: Сорох газын хэмжээ
Өm: Газын тоолуурын хэм
Ma: Нийт соргдсон чийгшилийн хэмжээ

Pa: Агаарын даралт(kPa)
Pm: Газын тоолуурын даралт(kPa)
Pv: Өm Дүүрэн усны ууршилтын даралт(kPa)

Хаягдал газанд агуулагдах тоосны нягтширалд хэмжилт хийх арга(JIS Z 8808)

Газын бүтцийн хэмжилт (Orsat -н анализ хийх арга)



Тооцоолох арга

$$\rho_0 = \frac{1}{22.4 \times 100}\left[\{44 \times CO_2 + 32 \times O_2 + 28(CO + N_2)\}\left(1 - \frac{\chi_w}{100}\right) + 18 \times \chi_w\right]$$

$$\rho = \rho_0 \times \frac{273}{273 + \theta_s} \times \frac{P_a + P_s}{101.3}$$

CO2: Нүүрсхүчилийн хийн концентрацын хэмжилт(%)

O2: Хүчилтөрөгчийн концентрацын хэмжилт(%)

CO: Нүүрсний дутуу исэлийн концентрацын хэмжилт(%)

N2: Азотын концентрацын хэмжилт(%)

P: Газын нягтрал(kg/Nm³)

P0: Газын нягтрал(kg/Nm³)

Θs: Хаягдал газын хэм(℃)

Xw: чийгшилийн хэмжээ(%)

Ps: газын нам даралт(kPa)

Pa: агаарын даралт(kPa)

Хаягдал газанд агуулагдах тоосны нягтширалд　хэмжилт хийх арга(JIS Z 8808)

Нам даралтын хэмжилт

Нам даралтын хэмжилт

←U-үсгэн хоолойгоор хэмжинэ.

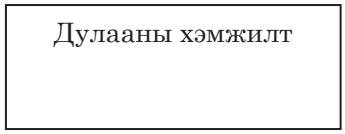
Тооцоолох арга

・нам даралт　(Ps)=Ps(mmH^2O)×9.81/1000

・нам даралт　(Ps)=Ps(mmHg)/760×101.3

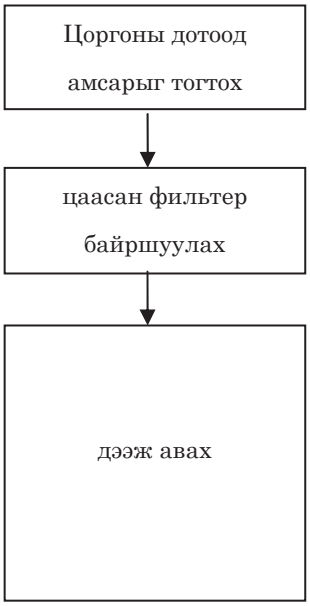
Хаягдал газанд агуулагдах тоосны нягтширалд　хэмжилт хийх арга(JIS Z 8808)

Дулааны хэмжилт



←Халаасны термометрээр хэмжинэ.

Хаягдал газанд агуулагдах тоосны нягтширалд анализ хийх арга (JIS　Z 8808)



←шингэн, газын найрлага, нам даралт, дундаж хурд, хаягдал газын дулааны хэмжилтийн үр дүнгээс

←агаарын даралтын хэмжилт

←Газын тоолуурын заалтыг харах

←Газын тоолуурын дулааны хэмийг хара х

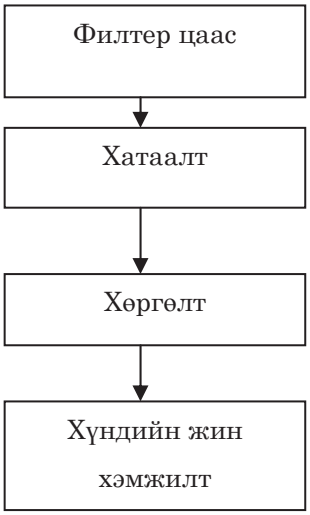
←Дээжийн соролтын хурд ижил хурдтай соролтоор
10л/мин - 20л/мин

←Дээжийн соролтын хэмжээ тоосны хэмжээ их тохиолдолд дундаж　байдлаар　(　0℃・1даралт) 100л орчим
Дээжийн соролтын хэмжээ тоосны хэмжээ бага　тохиолдолд дундаж байдлаар　(0℃・1даралт) 500л орчим

Хаягдал газанд агуулагдах тоосны нягтширалд анализ хийх арга (JIS　Z 8808)

（Филтер цаасны хүндийн жинг хэмжих арга）

＜Хэмжилтийн өмнө＞

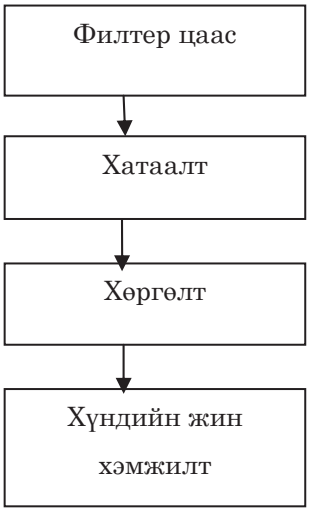


← Хатаагчинд 105-110℃ -д 1-2 цаг хатаана.

←Дэсикэтр (desiccator) -т хөргөнө (2цаг орчим)

←0.1млг хүртэл нарийвчлалтайгаар үнэн зөв хэмжилт хийх

＜Хэмжилтийн дараа＞



← Хатаагчинд 105-110℃ -д 1-2 цаг хатаана.

※Хатаах цагыг өмнө нь тогтсон байх

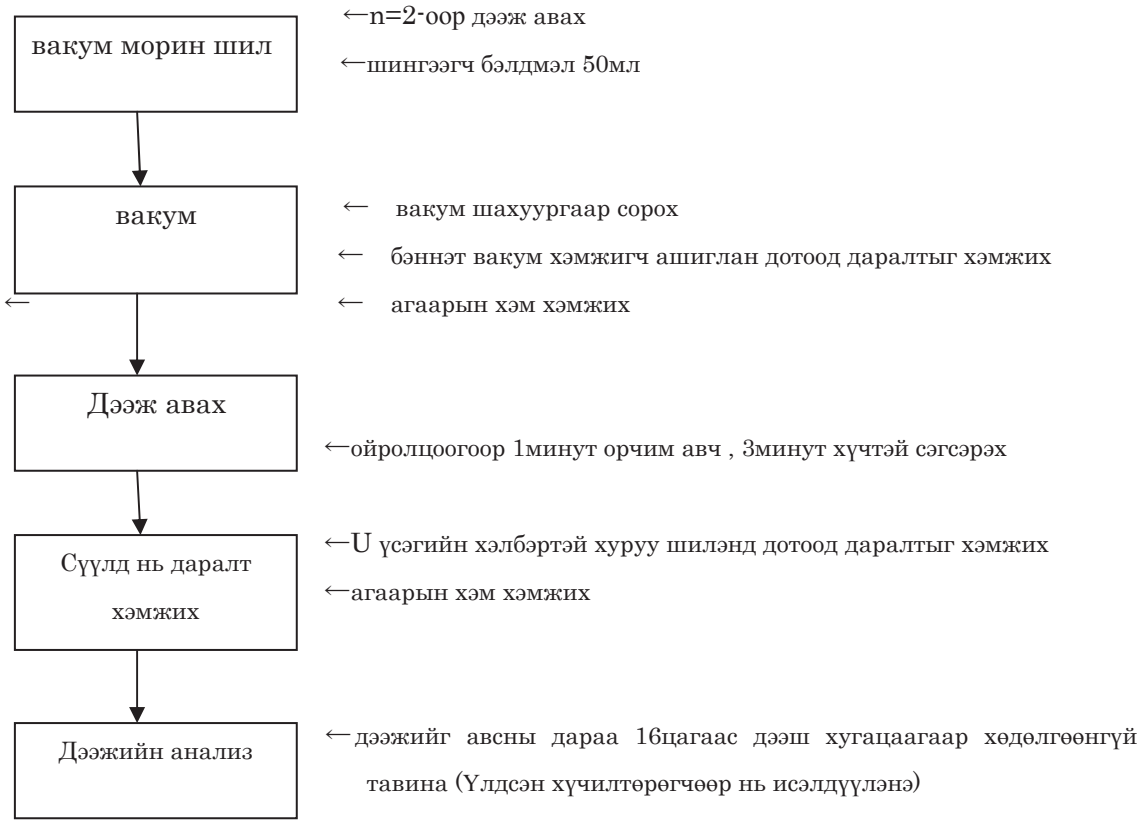
←Дэсикэтр (desiccator) -т хөргөнө (2цаг орчим)

←0.1млг хүртэл нарийвчлалтайгаар үнэн зөв хэмжилт хийх

Хэмжилтийн өмнөх буюу дараахь үеийн цаасан филтерийн хүндийн жин болон ялгааг тэмдэглэх.

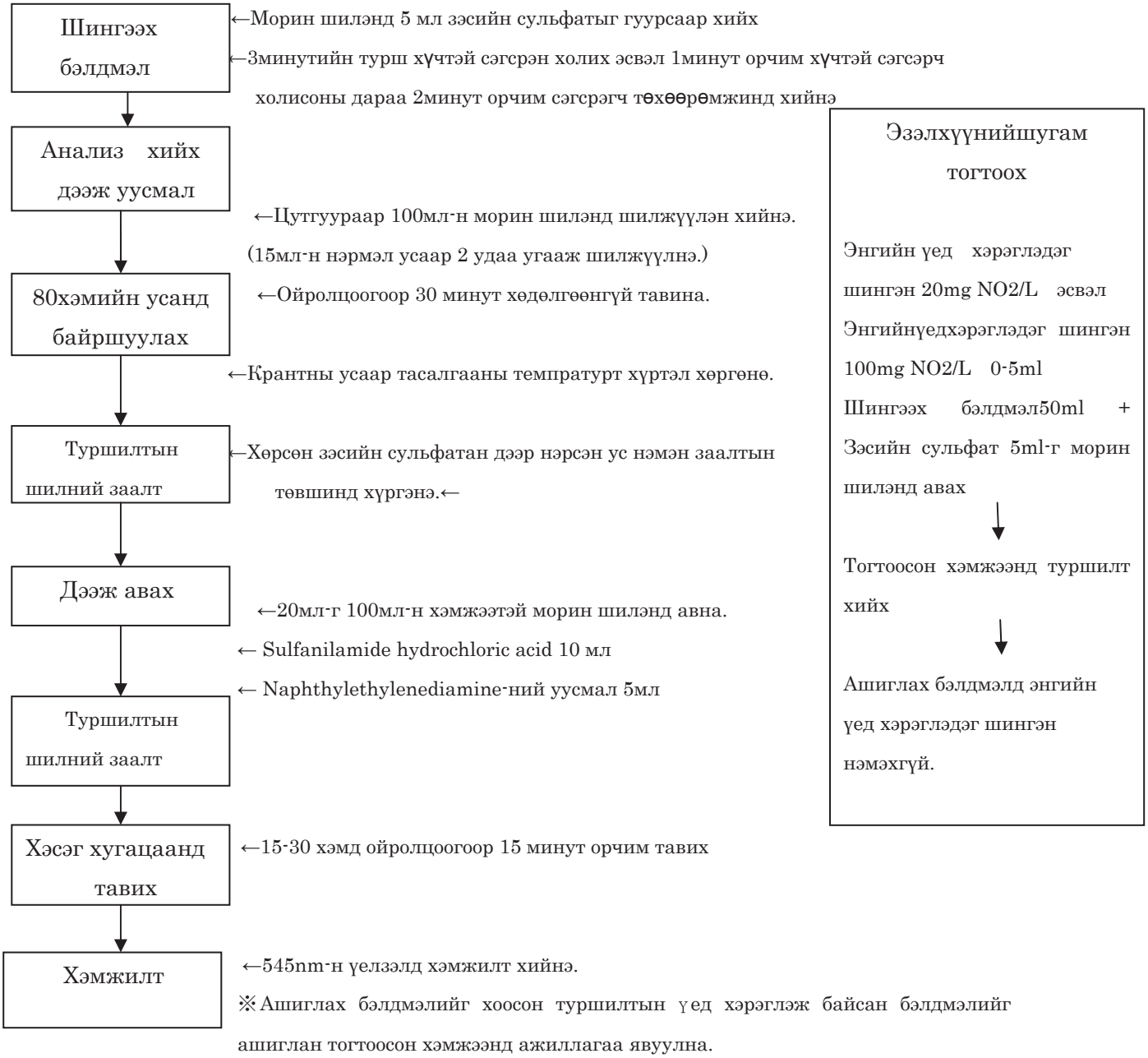
Хаягдал газанд агуулагдах азотын исэлд анализ хийх арга(JIS K 0104)

Naphthylethylenediamine (visible) absorption spectrophotometry method (NEDA -н арга)



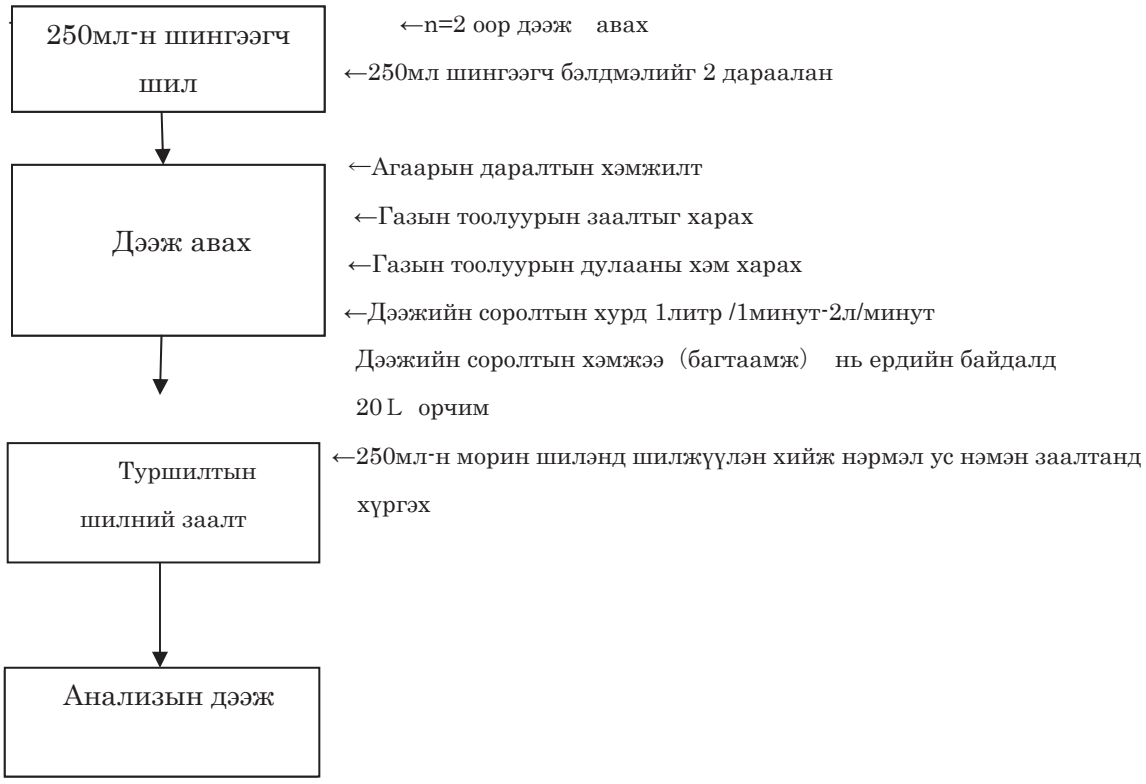
Хаягдал газанд агуулагдах азотын исэлд анализ хийх арга(JIS K 0104)

Naphthylethylenediamine (visible) absorption spectrophotometry method (NEDA -н арга)



Хаягдал газанд агуулагдах хүхэрийн исэлд анализ хийх арга(JIS K 0103)

Тундас үүсгэх замаар тодорхойлох арга (arsenazo III-н арга)

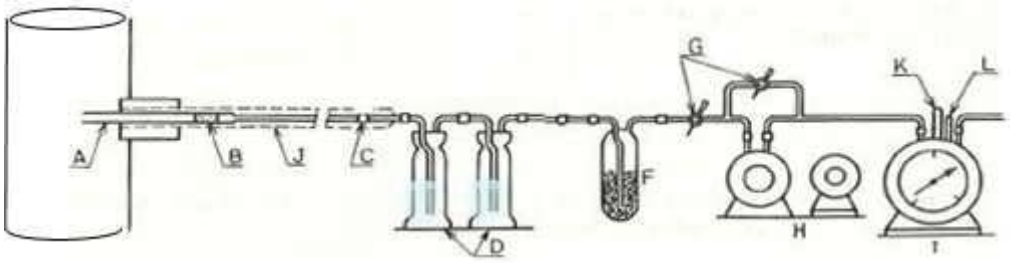


SOx Analysis for Stack Monitoring

Measurement method; Precipitation Titrimetry (Arsenazo Ⅲ)

1. Outline of H_2S gas Analysis for Stack Monitoring

1.1 Gas Sampling



1.2 Analysis method

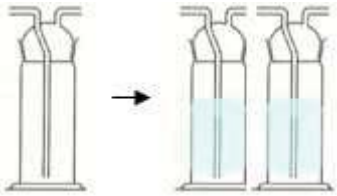
Precipitation Titrimetry (Arsenazo Ⅲ)

2. Preparation

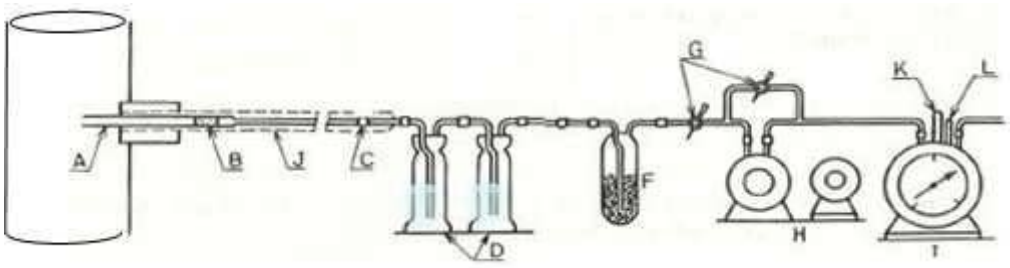
2.1 Absorbing Solution

Reagent
1. H_2O_2 (Hydrogen Peroxide) 30%　30ml
2. Deionized water　270ml

Put respectively 50 ml **Absorbing solution** into 250 ml impingers. Prepare 2 bottles.



3. Gas Sample Collection at Site (Stack)



Leak check test must be done before starting of gas sampling

Gas Sampling Flow rate: around1 l/min

Total sampling gas volume: around 20 litters

Measurement method; Precipitation Titrimetry (Arsenazo Ⅲ)

4. Analysis by Titrimetry

4.1 Preparation

Reagent

1. Deionized water
2. H_2SO_4 0.05 mol/L （Sulfuric acid） 500ml bottle
3. Arsenazo Ⅲ
4. $Ba(OCOCH_3)_2$ （Barium acetate） 500g bottle
5. $Pb(OCOCH_3)_2 \cdot 3H_2O$ （Lead acetate trihydrate） 500g bottle
6. CH_3COOH （Acetic acid） 500ml bottle
7. 2-propanol 500ml bottle
8. C_2H_5OH （Ethanol 95) 500ml bottle

--------Стандартчилал тогтоох уусмал----------

9. Bromophenol blue
10. $NaCO_3$ (Sodium carbonate / anhydrous)

4.1.1 Preparation of 2 mmol/L H_2SO_4

20 ml

+ Deionized water

25 дахин
шингэрүүлэх

Fill the flask up to
500 ml gauge line

Хэрэглэх уусмалын тухайд「H_2SO_4 0.05 mol/L」урьдчилан Factor-г нь тодорхой болгохгүй бол болохгүй. Энэ удаад худалдаалагдаж буй зүйл болохоор ямар Factor-той болох нь тодорхой зүйлийг хэрэглэх учраас Factor-г нягтлах ажиллагаа хэрэггүй.

＜Factor-г тодорхойлох тохиолдолд стандартчилал тогтоохын тулд дараах уусмалуудыг ашиглана＞

①「 Bromophenol blue ② $NaCO_3$ (Sodium carbonate / anhydrous)

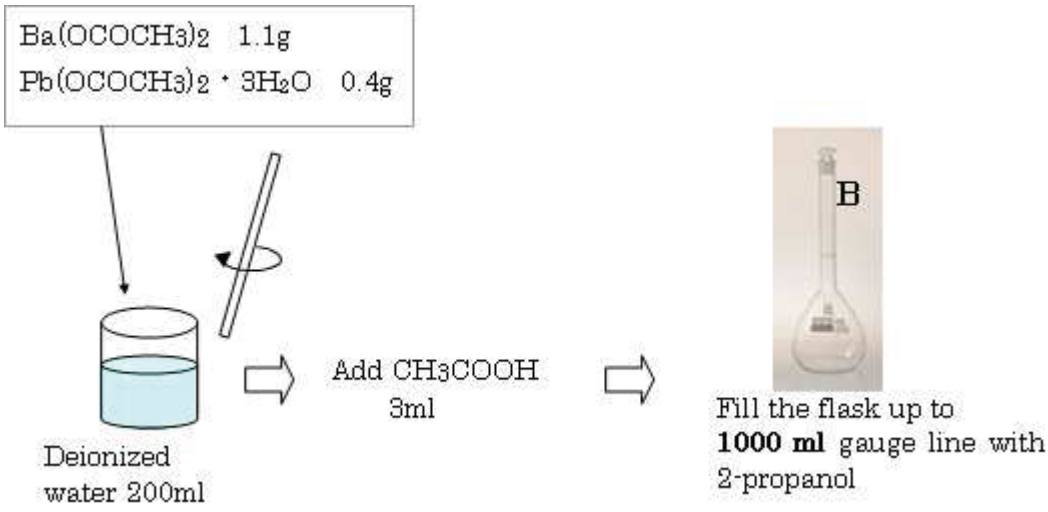
Стандарт тогтоох аргачлалыг JIS K0103-н p.905-хуудаст бичсэн байгаа.

4.1.2 Preparation of Arsenazo Ⅲ Solution

Arsenazo Ⅲ 0.2g-г микро жинлүүрээр хэмжин авч, Deionized water 100ml-г нэмж сайтар сэгсэрч холино. Уусгасаны дараа хүрэн өнгийн шилэн саванд хийж хадгална. Хадгалах

хугацаа 1 сар.

4.1.3 Preparation of 5 m mol/L Barium Acetate Solution



Бэлдсэн「Barium Acetate」-н уусмалын агууламжийг дараах дараах пепитикээр хэмжиж гаргана.

----------①～④-г бэлдэж 200ml Flask-т хийх. ----------

10ml
Pipette-р нарийн зөв хэмжиж авах

40 ml

③ CH_3COOH 1ml

④ Arsenazo Ⅲ Solution 4～6 дусал

200 ml flask

＜Titration-р B（Barium Acetate） -н агууламжийг тодорхойлох.

5ml-н Micro bullet-г ашиглана.
Уусмалын цэнхэр өнгийг 1 минутын хугацаанд ажиглана.
B-н орсон хэмжээг унших.
Дараах томъёогоор F-г тодорхойлно.

$$F = \frac{10 \times f}{a} \times \frac{2}{5}$$

Where;
F ; 5 m mol/L Barium Acetate-н Factor
f ; 2 m mol/L H_2SO_4-н Factor
a ; Пепитикээр хийсэн B-н хэмжээ (ml)

4.2 Determination of the Sample Concentration

4.2.1 Sample Conditioning

Бэлдсэн дээжээ 250ml Flask-т шилжүүлэн хийнэ.

Ионжуулсан усаар угааж үлдэгдэл уусмалыг бүгдийг нь шилжүүлэн хийнэ.

Fill the flask up to 250 ml gauge line with deionized water

-------Дараах 4 уусмалыг 200ml Flask-т хийнэ. ----------

①

Дээж **10**ml

②

40 ml

③ CH_3COOH 1ml

④ Arsenazo Ⅲ Solution 4～6 дусал

200 ml flask

---------Дээжийг Barium Acetate Solution(B)-р дусал дуслаар хийх. ----------

Уусмалын цэнхэр өнгийг 1 минутын хугацаанд ажиглана.

B-н хэрэглэсэн хэмжээг уншиж тэмдэглэнэ.

（ **a** ml болгох.）

SOx Analysis for Stack Monitoring

Measurement method; Precipitation Titrimetry (Arsenazo Ⅲ)

---------Blank-г Barium Acetate Solution(B)-р пепиткээр хийнэ.----------

（Шингээгч уусмалд орсон байх магадлалтай өчүүхэн хэмжээний SOx-н агууламжийг хэмжих.）

Шингээгч уусмал（ Absorbing Solution ）**100**ml-г 250ml Flask-д хийн ионжуулсан усаар шингэрүүлнэ.

Fill the flask up to 250 ml gauge line with deionized water

-------Дараах 4 уусмалыг 200ml Flask-т хийнэ. ----------

①

Blank **10**ml

②

40 ml

③ CH_3COOH 1ml

④ Arsenazo Ⅲ Solution 4～6 дусал

200 ml flask

Микро пепитка ашиглан шингэний цэнхэр өнгийг 1 минутын хугацаанд ажиглана.

B-н хэрэглэсэн хэмжээг уншиж, тэмдэглэнэ.

（ **b** ml болгох）

Энэхүү хаягдал уусмалд хар тугалга болон хүнцэл агуулагдаж буй тул устгал хийхдээ анхаарах хэрэгтэй.

5. Дээжийн агууламжийн тооцоо

Дээжинд агуулагдах SOx(Sulfur Oxides)-н эзэлэхүүн(Volppm)-г дараах томъёогоор тооцоолж гаргана.

$$Cv = \frac{0.112 \times (a - b) \times F \times 250 / 10}{Vs} \times 1000 \quad (\text{Volppm})$$

Хэрвээ SOx-г SO_2-р тооцож, мөн түүнийг жингээр илэрхийлэх тохиолдолд дараах томъёог ашиглана.

$$Cw = \frac{0.320 \times (a - b) \times F \times 250 / 10}{Vs} \times 1000 \quad (\text{mg/m}^3{}_N)$$

Where;

Cv : Дээжинд агуулагдах SOx-н эзэлэхүүн(Volppm)

Cw : Дээжинд агуулагдах SOx-г SO_2-р илэрхийэх үеийн масс ($mg/m^3{}_N$)

a ; Дээжинд ашигласан 5 m mol/L Barium Acetate-н хэмжээ (ml)

b ; Blank-г хийхэд ашигласан 5 m mol/L Barium Acetate-н хэмжээ (ml)

F ; 5 m mol/L Barium Acetate-н Factor

Vs; Дээж хийн эзэлэхүүн (Хэвийн нөхцөл рүү шилжүүлсэний дараах) (L_N)

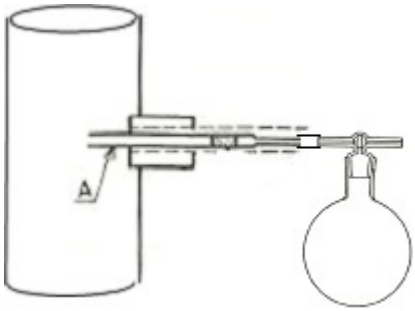
0.112 ; 5 m mol/L Barium Acetate-т тохирох Sox-н Хэвийн нөхцөл дэх эзэлэхүүн (ml)

0.320 ; 5 m mol/L Barium Acetate-т тохирох SO_2-н бодит масс.(mg)

1. Outline of NOx gas Analysis for Stack Monitoring

1.1 Gas Sampling

Вакуум шилэн савыг ашиглан хаягдал утаанаас дээж авна.



1.2 Analysis Method

NEDA (Naphthyl ethylenediamine absorptiometry) by Absorption Spectrometer

Дээжилж авсан хаягдал утаан дахь NOx-ийн агууламжийг фото спектрометр ашиглан хэмжинэ.

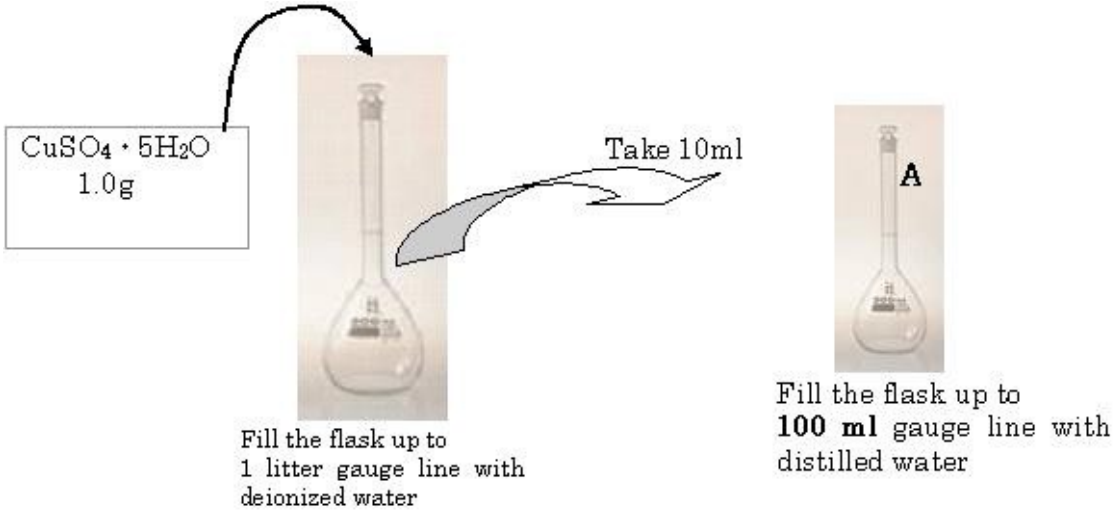
2. Preparation

2.1 Absorbing Solution

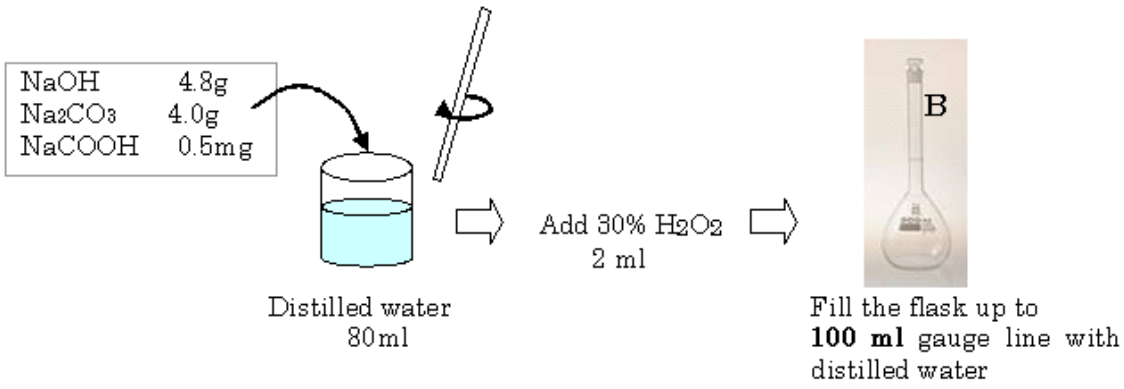
Хаягдал утаан дахь NOx-ийг шингээх 2 төрлийн уусмал (A болон B) бэлдэнэ.

Reagent		
1. $CuSO_4 \cdot 5H_2O$	(Cupper Sulfate Pentahydrate)	500g bottle
2. NaOH	(Sodium Hydroxide)	500g bottle
3. Na_2CO_3	(Sodium Carbonate)	500g bottle
4. NaCOOH	(Sodium Formate)	500g bottle

< A solution >



< B solution >



2.2 Sufanilamide HCl Solution

200мл-ийн шилэн саванд 50 мл нэрмэл ус хийн, 1,0 г Sufanilamide-ийг уусгана. Улмаар 112 мл давсны хүчил нэмсний дараа зураас хүртэл нэрмэл ус нэмнэ.

2.3 Naphthylethylenediamine Solution

N-1- naphthylethylenediamine dihydrochloride 0.1г-ийг 100 мл нэрмэл уусанд уусгана.

2.4 NO_2^- Standard Solution (100mg NO_2^-/L)

1000 мг NO_2^-/L стандарт уусмал (500мл-ийн шил)-аас 10 мл-ийг аван, 100 мл-ийн шилэн саванд хийн, зураас хүртэл нэрмэл ус нэмнэ.

2.5 Gas Sampling Flask

Хаягдал хийн дээж авахад вакуум шилэн сав (1.2 л-ийн багтаамжтай)-ыг ашиглана. Насосоор шилэн саван дахь агаарыг сорж аван, вакуумжуулан бэлдэж, хэмжилтийн талбай руу авч явах. (Энэ аргачлалд шилэн саванд урьдчилан гэрэл шингээлтийн бодис хийх шаардлагагүй.)

2.5.1 Шилэн савыг вакуумжуулах

Хамгийн багадаа 2 вакуум шилэн сав бэлтгэнэ. Жижиг оврын насос ашиглан шилэн савыг агааргүй болгоно. Тагтай болгоомжтой харьцах.

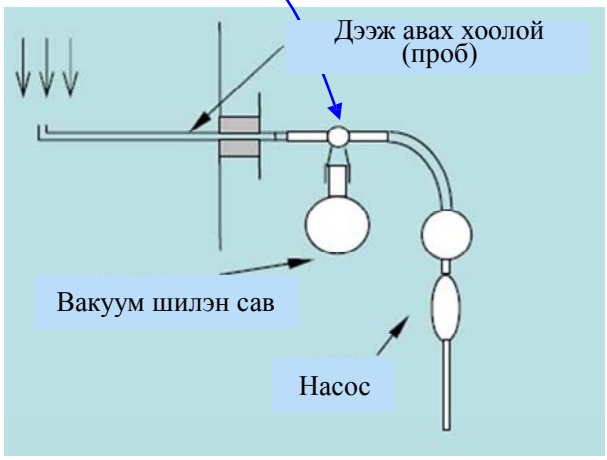
2.5.2 Шилэн савны дотор даралт, орчны температурыг хэмжих

Даралт хэмжигч болон температур хэмжигч ашиглан, вакуумжуулсан шилэн савны дотор даралт (дээж авахаас өмнөх): Pi (kPa), болон орчны температур (дээж авахаас өмнөх): Ti (℃)-ийг тэмдэглэж авна. Вакуум шилэн сав тус бүрийг хэмжин тэмдэглэж авна.

3. Gas Sample Collection at Monitoring Site

Шилэн саван дахь вакуум орчныг ашиглан, дараах дарааллын дагуу хоолой дахь хаягдал утааг богино хугацаанд шилэн саванд соруулан, дээж авна (хэмжилтийн талбай дахь ажил).

1) Зургийн дагуу дээж авах төхөөрөмжийг хоолойд суурьлуулна. Дээж авах төхөөрөмжинд хийн алдагдал байж болохгүй. Дээжний тоо (шилэн савны тоо) нь 2-оос дээш байх.
2) Гар насосоор дээж авах хоолой болон вакуумжуулсан шилэн савны холбогдсон хэсгийг хаягдал утаагаар солино. (Вакуумжуулсан шилэн савны дээд талын таглааны чиглэлийг анхаарах)
3) Тагыг тохируулан, вакуумж шилэн саванд хаягдал утааг соруулна.



4) Дээж авсны дараа 2.5.2-т бичсэний дагуу шилэн савны дотор даралт болон орчны температурыг хэмжин тэмдэглэнэ.

   Шилэн саван дахь дотоод даралт (дээж авсаны дараа): P_f (kPa), орчны температур (дээж авсаны дараа): T_f (℃)-ийг вакуумжуулсан шилэн сав тус бүрээр тэмдэглэнэ.

5) 100 мл-ийн шприцэд А уусмалаас 5 мл, В уусмалаас 50 мл-ийг хийнэ. Шприцэнд агаар үлдээхгүй байх.
(Шүлтлэг уусмалаас гараа хамгаалахын тулд резинэн бээлий өмсөнө.)

6) Хаягдал утааг вакуум шилэн саванд дээж авангуутаа (5 минутын дотор), (зургийн дагуу) шприцийг вакуум шилэн саванд холбон, уусмалыг вакуум шилэн саванд хийнэ. (Тагны чиглэлийг анхаарах)

(Энэ ажиллагааг хэмжилтийн талбайд хийнэ.)

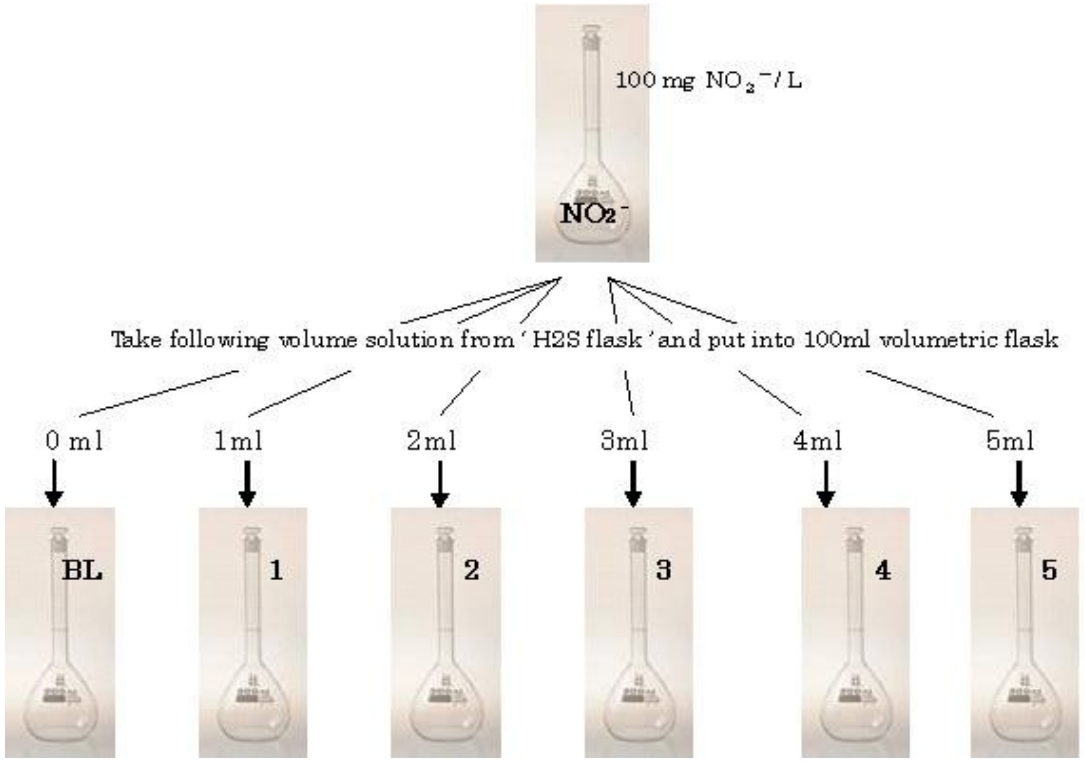
Шахаж дуусангуут шприцийг салган шууд тагыг таглана.

7) Хоёр гараараа шилэн саваа барин, тэр даруйдаа 3 минутийн турш шилэн савыг хүчтэй сэгсэрнэ. Ингээд хаягдал утаан дахь NOx нь шингээлтийн уусмалд шингэнэ. Хэмжилтийн талбай дахь ажиллагаа дуусна.

4. Analysis by Absorption Spectrophotometer

4.1 Preparation of Making a New Standard Curve for NOx Analysis

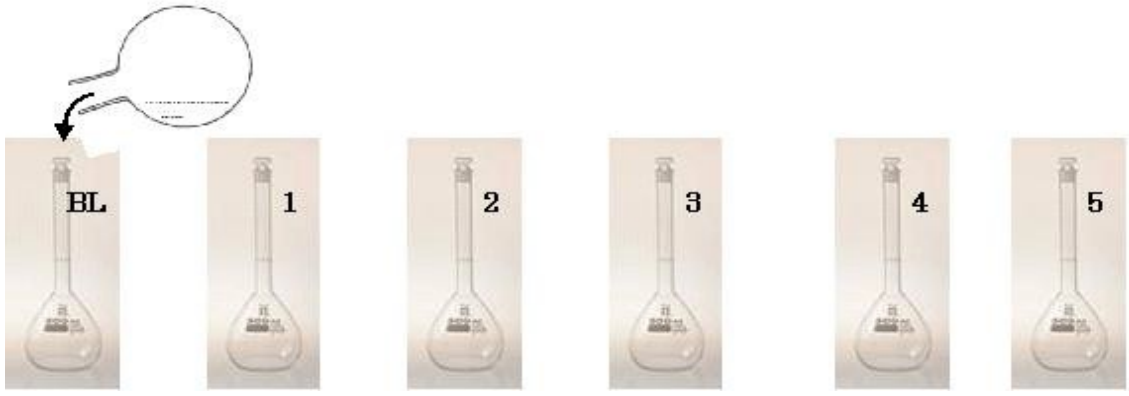
2.4-ийн дагуу бэлтгэсэн NO_2^- Standard Solution (100мг NO_2^-/L) ийн шилэн савнаас 1 ～5 мл-ыг дэс дараатайгаар аван, 100мл-ийн шилэн саванд хийнэ.



Цэвэрлэсэн 6 ширхэг шилэн колб бэлдэнэ. Тус бүрд (хаягдал утаа биш өрөөний агаартай) §3-ийн 5), 6), 7) үйлдлийг хийнэ.

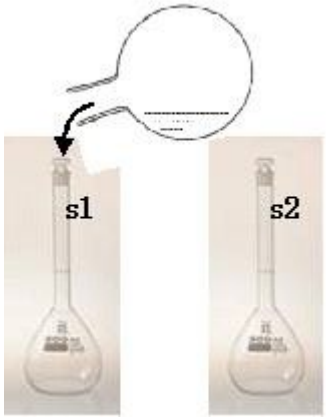
Түүний дараа 6 шилэн колб дахь уусмал тус бүрийг 「0～5」 дугаарын 100мл-ийн шилэн колб руу бүгдийг шилжүүлнэ.

Шилжүүлсэний дараа улмаар вакуум шилэн савыг ойролцоогоор 15мл-ийн усаар 2 удаа зайлан угаана. Энэ угаасан шингэнээ мөн 100 мл-ийн шилэн саванд шилжүүлнэ. (Бүх вакуум шилэн савыг угаан шилжүүлэх.)



4.2 Дээжийг солих

§ 3-ийн 7) хүртэлх ажиллагаагаар хэмжилтийн талбай дээр авсан дээжийн хувьд ч дээрх ажиллагаатай адилаар 100 мл-ийн шилэн савand шилжүүлнэ.



4.3 Дээжийг халаах болон хөргөх

Халуун хадгалагчид ус хийн, тохируулгыг 80℃-т тохируулна.

4.1, 4.2-оор бэлтгэсэн 「Blank, 1～5, дээж」-ийн бүх шилэн савны тагыг нээн тэдгээрийг 80℃-ийн халуун усанд хийн, 30 минут байлгана. (Хий ихээр гадагшлана).

30 минутын дараа халуун хадгалагчаас гарган шилэн савны гаднаас крантны хүйтэн ус гоожуулан шилэн савны темпертурыг бууруулна.

Тасалгааны хэм хүртэл буурсаны дараа зураас хүртэл нэрмэл ус хийнэ. Дараа нь таглан бага зэрэг сэгсэрнэ. Үүнийгээ дүн шинжилгээний дээж уусмал болгон ашиглана.

5. Өнгө орох／гэрэл шингээх эрчим хэмжих

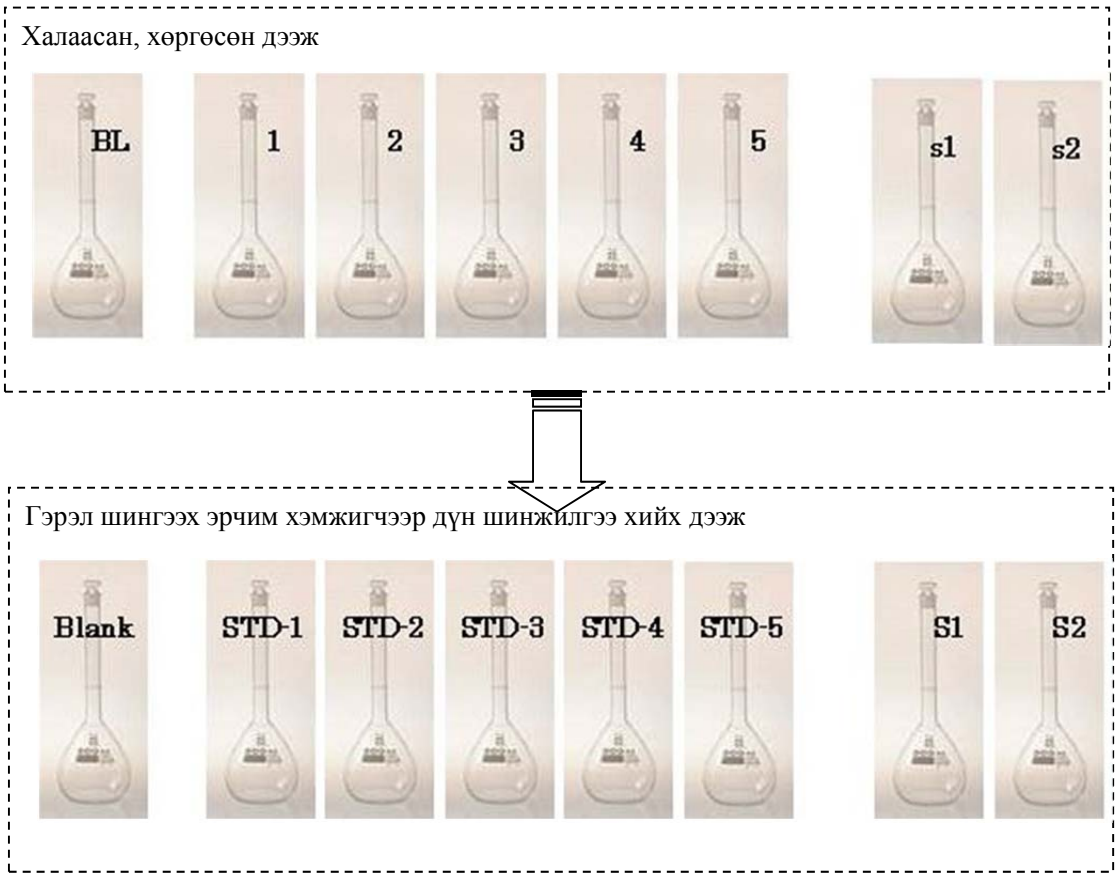
100 мл-ийн 8 шинэ шилэн сав бэлдэнэ.

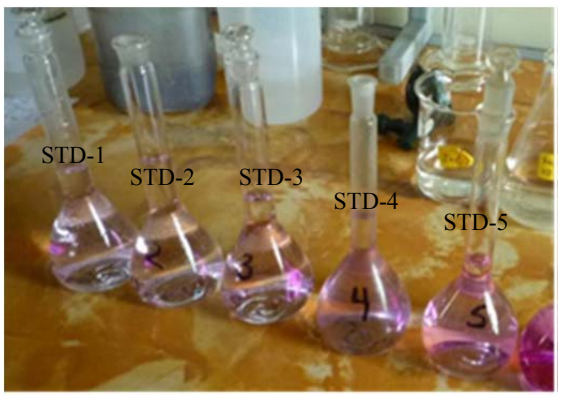
Халаасан эсвэл хөргөсөн дүн шинжилгээний дээж уусмалаас тус бүр 20 мл-ийг аван, 100 мл-ийн шинэ шилэн саванд шилжүүлнэ.

Улмаар дараах уусмалыг шилэн сав тус бүрт нэмнэ.

① 2.2 - т хийсэн Sufanilamide HCl Solution-ийг 10 мл
② 2.3-т хийсэн Naphthylethylenediamine Solution-ийг 5 мл

Түүнийхээ дараа нэрмэл усыг зураас хүртэл нэмэн, таглан сайтар сэгсэрнэ. Улмаар тасалгааны хэм (15～30℃)-д ойролцоогоор 15 минут байлган, гэрэл шингээлтийн эрчим хэмжигч (**долгионы урт 545 нм**)-ээр гэрлийн шингээх эрчмийг хэмжинэ.





6. Determination of the sample concentration

Хаягдал утааны дээжийн эзлэхүүн болон шингээгч бодисонд шингэсэн NO2-ийн массаар хаягдал утаан дахь азотын ислүүдийн агууламжийг тооцоолж болно.

6.1 Хаягдал утааны дээжний эзлэхүүнийг тооцоолон гаргах

Хуурай хийн эзлэхүүн (Dry gas volume)-ийг дараах томъёогоор тооцоолно.

$$V_{SD} = Va \times \frac{273.15}{101.32} \times \left[\frac{P_f - P_{nf}}{273.15 + t_f} - \frac{P_i}{273.15 + t_i} \right] \quad (ml)$$

Where,

V_{SD} ; Хуурай хийн эзлэхүүн (мл)

Va ; Вакуум шилэн савын эзлэхүүн (мл) (шилэн сав тус бүрийн гадна бичигдсэн хэмжээс)

P_f ; Дээж хийг авсаны дараа хэмжсэн вакуум шилэн савны дотор даралт (кPa)

P_{nf} ; t_i℃-ийн ханасан усны уурын даралт (кPa)

P_i ; Дээж хийг авахаас өмнө хэмжсэн вакуум шилэн савны дотор даралт (кPa)

t_i ; P_i-ийг хэмжсэн үеийн орчны агаарын хэм (℃)

t_f ; P_f-ийг хэмжсэн үеийн орчны агаарын хэм (℃)

6.2 Хаягдал утаан дахь азотын ислүүдийн агууламж (Хуурай хийн дэх агууламж)

$$C_V = \frac{0.487 \times V}{V_{SD}} \times \frac{100}{20} \times 10^6 \quad (volppm)$$

$$C_W = \frac{V}{V_{SD}} \times \frac{100}{20} \times 10^6 \quad (mg/m^3)$$

Where,

C_V ; Дээж хийн дэх азотын ислүүдийн эзлэхүүний агууламж (volppm)

C_W ; Дээж хийн дэх азотын ислүүдийн массын агууламж (мг/м^3)

V ; Дээжийн гэрэл шингээх эрчимд дүн шинжилгээ хийсэн дүн. Дүн шинжилгээний муруйгаас тооцоолсон азотын давхар ислийн масс (мг)

20 ; Дүн шинжилгээний дээжийн уусмалын хэмжээ (мл)

0.487 ; Азотын давхар исэл 1мг-тай тэнцэх азотын давхар ислийн эзлэхүүн (мл)

Хавсралт2.2-2 Сорьцын цэг суурилагдсан УХЗ ны жагсаалт

Сорьцийн цэг суурьлагдсан зуух（1 дэх жил） Нийт 20 газар

NO.	Owners / Users / Location	Country	Type	Capacity MW	Stack Type	Latitude	Longitude
1	#113 Secondary School / Bayangol Dist.	Mongolia	MDZ-0.25	0.25	Steel Pipe	47.92609	106.86626
2	#46 School / Bayangol Dist., West Side of Mongol TV	China	KCR-300	0.7	Steel Pipe	47.930738	106.887426
3	Mental Hospital / Bayanzurkh Dist.	Mongolia	BZUI-100	0.85	Steel Pipe	47.932038	107.011396
4	Mental Hospital / Bayanzurkh Dist.	Mongolia Mongolia	HP-18-27	0.2	Steel Pipe	47.932133	107.01125
5	Auto Hall / Bayanzurkh Dist.	Mongolia	HP25J	Unknown	Steel Pipe	47.92476	106.98843
6	EcoHangul / #92 Secondary School / Bayanzurkh Dist.	Mongolia	MDZ-063	0.63	Steel Pipe	47.918456	106.997397
7	Tushigtkhougei LLC /#41 Secondary School /	Hungary	Carborobot 300	0.3	Steel Pipe	47.870604	106.81838
8	Tushigtkhougei LLC /#41 Secondary School /	Russia	MUHT	0.7	Brick	47.870607	106.818434
9	RVR / #10 Secondary School	Mongolia	MWB	1	Brick	47.752037	106.564608
10	#104 School / Songino Khairhan Dist.	China	WWGS-0.35	0.35	Concrete	47.967374	106.830493
11	"Erdenesuvraga"Co. Ltd. / #39 School	China	DZL 1.4	1.4	Steel Pipe	47.935861	106.906011
12	Rescue Force Residence / Songino Khairhan Dist.	Mongolia	HP-30J	0.18	Steel Pipe	47.91349	106.74569
13	Bosa Shopping Center, etc. / Bayanzurkh Dist.	Mongolia	RJG-18	Unknown	Steel Pipe	47.90828	107.01172
14	Tavan gan / Building of rental rooms, Pasta Production Factory / Baynzurh Dist.	China	CLSG25	0.25	Steel Pipe	47.91621	106.99145
15	MCS Tiger beer	China	DZL 4	4	Steel Pipe	47.9057	107.02302
16	Coca Cola	China	DZL 6	6	Steel Pipe	47.907511	107.022238
17	Burd Center / Shukhbaatar Dist	China	LSG-0.20	0.2	Steel Pipe	47.93979	106.91727
18	#71 School / Shukhbaatar Dist.	China	CWNG-0.35	0.35	Concrete	47.99778	106.97011
19	#106 School / Songino Khairhan Dist.	Mongolia	Thermochlor-0.3	0.35	Concrete	47.91985	106.75085
20	Tenger Sudar LLC / Shukhbaatar Dist.	Mongolia	Hand Made	Unknown	Steel Pipe	47.968222	106.930212

Сорьцийн цэг суурьлагдсан зуух（2 дэх жил） Нийт 35 газар

Report	Boiler House				HOB				
Name	No	Name	District	Khoroo	No	Model	Country	Installed Year	Capacity (kW)
58-р сургууль	81	58-р сургуулийн халаалтын зуух	СҮХБААТАР	15-р хороо	1	МУХТ	МОНГОЛ	2011	810
					2	МУХТ	МОНГОЛ	2011	810
61-р сургууль 1	51	61-р сургуулийн халаалтын зуух	ЧИНГЭЛТЭЙ	12-р хороо	1	Китурами	Солонгос	2011	350
61-р сургууль 2					2	Китурами	Солонгос	2011	350
76-р сургууль	95	76-р сургуулийн халаалтын зуухны газар	СОНГИНОХАЙРХАН	9-р хороо	1	БЗУИ-100А	МОНГОЛ	2010	810
					2	БЗУИ-100А	МОНГОЛ	2010	810
					3	ЭКО-500	МОНГОЛ	2007	500
					4	ЭКО-500	МОНГОЛ	2007	500
79-р сургууль	23	79-р сургуулийн (бага) халаалтын зуух	БАЯНЗҮРХ	9-р хороо	1	CARBOROBOT	УНГАР	2010	180
102-р сургууль 1	20	102-р сургуулийн халаалтын зуух	БАЯНЗҮРХ	21-р хороо	1	MDZ	МОНГОЛ	2007	250
					2	MDZ	МОНГОЛ	2007	250
117-р сургууль	41	117-р сургуулийн халаалтын зуух	ЧИНГЭЛТЭЙ	18-р хороо	1	HP-30Ж	МОНГОЛ	2009	244
					2	HP-30Ж	МОНГОЛ	2009	244
118-р сургууль		118-р сургууль	ХАНУУЛ		1	CARBOROBOT	УНГАР	2011	
					2	CARBOROBOT	УНГАР	2011	
Онцгой байдлл 1	99	Аврах тусгай ангийн халаалтын зуухны газар	СОНГИНОХАЙРХАН	21-р хороо	1	CLSG	БНХАУ	2006	300-400
Гэгээ хотхон	33	Гэгээ хотхоны халаалтын зуух	БАЯНЗҮРХ	5-р хороо	1	MDZ	МОНГОЛ УЛС, МОНДУЛААН ТРЕЙД ХХК	2007	250
59-р сургууль	56	59-р сургуулийн халаалтын зуух	ХАНУУЛ	14-р хороо	1	MDZ	МОНГОЛ	2006	63
					2	MDZ	МОНГОЛ	2006	63
Төмөр зам ПДМС	37	Амгалан дахь УБТЗ Хангах баазын халаалтын зуух	БАЯНЗҮРХ	10-р хороо	1	HP-18-54	МОНГОЛ	2007	500
					2	HP-18-54	МОНГОЛ	2007	500
					3	HP-18-54	МОНГОЛ	2007	500
Түшигт хангай 1	61	41-р сургуулийн халаалтын зуух	ХАНУУЛ	5-р хороо	1	МУХТ-1,2	МОНГОЛ	2010	1200
					2	КВ3-06	ОХУ	2009	600
Хаан Банк									
Түшигт хангай Хонхор	18	Түшигтхангай ХХК 88-р сургуулийн Усан халаалтын /30-р/ зуух	БАЯНЗҮРХ	11-р хороо	1	КВ3-06	ОХУ	2007	600
					2	КВ3-06	ОХУ	2007	600
Хүүхдийн эмнэлэг	69	Нэгдсэн эмнэлэг	ХАНУУЛ	4-р хороо	1	Карборобот	УНГАР	2009	300
					2	Карборобот	УНГАР	2009	300
					3	Карборобот	УНГАР	2009	300
Хүчит шонхор	50	Хүчит шонхор ХХК-ий халаалтын зуух	ЧИНГЭЛТЭЙ	11-р хороо	1	МОНДУЛААН	Монгол	2005	300
					2	МОНДУЛААН	МОНГОЛ	2005	300
Их засаг 1	21	ИЗИС-ийн халаалтын зуух	БАЯНЗҮРХ	4-р хороо	1	DZL 700	БНХАУ	2011	700
Их засаг 2					2	DZL 1400	БНХАУ	2006	1400
					3	CLSG-0,24	БНХАУ	2004	240
Экологийн хүрээлэн	83	Дулааны хүрээлэн ШУТИС	СҮХБААТАР	16-р хороо	1	ДТХ-0,3	МОНГОЛ	2007	350
60-р сургууль 1	60	Түшиг хангай ХХК-ий УХ-ын 60-р сургуулийн зуух	ХАНУУЛ	7-р хороо	6	МУХТ-1,2	МОНГОЛ	2010	1200
Хоёулаа хүү	4	Жанжин клубын халаалтын зуухны газар /10-р зуух/	БАЯНЗҮРХ	12-р хороо	1	Карборобот 140	УНГАР	2006	140
					2	HP-18/54	МОНГОЛ	2001	400-500
60-р сургууль 2	60	Түшиг хангай ХХК-ий УХ-ын 60-р сургуулийн зуух	ХАНУУЛ	7-р хороо	6	МУХТ-1,2	МОНГОЛ	2010	1200
Онцгой байдал 2	99	Аврах тусгай ангийн халаалтын зуухны газар	СОНГИНОХАЙРХАН	21-р хороо	1	CLSG	БНХАУ	2006	300-400
102-р сургууль 2	20	102-р сургуулийн халаалтын зуух	БАЯНЗҮРХ	21-р хороо	1	MDZ	МОНГОЛ	2007	250
					2	MDZ	МОНГОЛ	2007	250
105-р сургууль	103	105-р сургуулийн халаалтын зуухны газар	СОНГИНОХАЙРХАН	11-р хороо	1	VIADRUS-VSB15	МОНГОЛ	2006	390
					2	VIADRUS-VSB15	МОНГОЛ	2006	390
					3	VIADRUS-VSB15	МОНГОЛ	2006	390
					4	VIADRUS-VSB15	МОНГОЛ	2006	390
Жасмин		Оргихийн булаг ХХК	СҮХБААТАР	14-р хороо					
85-р сургууль	19	Түшигтхангай ХХК 85-р сургуулийн Усан халаалтын / 23-р/ зуух	БАЯНЗҮРХ	20-р хороо	1	МУХТ-1,2	МОНГОЛ	2008	1200
					2	КВ3-06	ОХУ	2007	600
Очир ундраа			СҮХБААТАР	12-р хороо		GZZZ			
Бөхөг	74	Бөхөг ХХК халаалтын зуухны газар	ХАНУУЛ	13-р хороо	1	CLSG	БНХАУ		920
УС-15	13	УС 15 халаалтын зуухны газар	БАЯНЗҮРХ	8-р хороо	1	БЗУИ-100	МОНГОЛ	1980	810
					2	БЗУИ-100	МОНГОЛ	1980	810
Авто төв			БАЯНЗҮРХ	19-р хороо		HP30Ж	МОНГОЛ		244
104 – сургууль	96	104-р сургуулийн халаалтын зуух	СОНГИНОХАЙРХАН	21-р хороо	1	CMNG-0,35	БНХАУ	2007	400
63-р сургууль	68	ХУД-ийн 63-р тусгай сургуулийн халаалтын зуух	ХАНУУЛ	4-р хороо	1	БНЭБ	МОНГОЛ	2007	250
Дорнын илч ХХК						МУХТ-0.07	МОНГОЛ		

Тайлбар : Утаа шүүгч төхөөрөмжийн оролт болон гаралт тус бүрт хэмжилт хийх зорилгоор 1 зууханд хэд хэдэн сорьцийн цэг суурьлуулсан тохиолдол байгаа.

Сорьцийн цэг суурьлуулалтын тайлан
測定孔設置の報告書

58-р сургууль

第58学校

61-р сургууль 1

第61学校①

61-р сургууль 1

第61学校②

76-р сургууль

第76学校

79-р сургууль

第79学校

102-р сургууль 1

第102学校①

117-р сургууль

第117学校

118-р сургууль

第118学校

Онцгой байдйл 1

緊急災害対策本部①

Гэгээ хотхон

ベロン

59-р сургууль

第59学校

Төмөр зам ПДМС

鉄道修理場

Түшигт хангай 1

Tushig Khangai①

Хаан Банк

Khaan銀行

Түшигт хангай Хонхор

Tushig Khangaiホンホル地域

Хүүхдийн эмнэлэг

子供病院

Хүчин шонхор

バザール

Их засаг 1

Ikh zasag大学①

Их засаг 2

Ikh zasag大学②

Экологийн хүрээлэн

エコロジー研究所

60-р сургууль 1

第60学校①

Хоёулаа хүү

Khoyulaa khuu

60-р сургууль 2

第60学校②

Онцгой байдал 2

緊急災害対策本部②

102-р сургууль 2

第102学校②

105-р сургууль

第105学校

Жасмин

Jasmin

85-р сургууль

第85学校

Очир ундраа

Ochir Undraa

Бөхөг

Bukhug

УС-15

US-15

Авто төв

Auto Hall

104 – сургууль

第104学校

63-р сургууль

第63学校

Дорнын илч ХХК

Dorniin ilch有限会社

※　全35箇所にて測定孔の設置を行いました。

Dorniin Ilch有限会社　　2012年1月10日

Хавсралт2.2-3 Утааны хийний хэмжилтийн зориулалттай фланец суурилуулах ажлын даалгавар, сорьцын цэгний техникийн үзүүлэлт, фланецын схем зураг болон утааны хэмжилтийн зориулалттай фланец суурилуулах ажлын даалгавар

Утааны хийн хэмжилтийн зориулалттай фланец хийх ажиллагааны даалгавар

1. Утааны хэмжилтийн фланец хийх зорилго

Утааны хэмжилтийн зориулалттай фланец хийх зорилго нь УБ хот орчмын УХЗ-аас гарч байгаа утааны бохирдуулагч бодисын агууламжийг хэмжих багажийг яндан руу шургуулах хэмжилтийн зориулалттай сорьцын цэг гаргахад оршино.

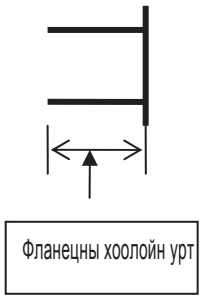
2. Гүйцэтгүүлэх агуулга

2.1 Утааны хэмжилтийн зориулалттай фланец хийх

Гүйцэтгэгч нь утааны хэмжилтийн фланец хийж бэлтгэнэ.

(1) Хийх тоо ширхэг

24 ширхэг（Ангилал；Фланжны урт15см х12ширхэг、20см х 6ширхэг、50см х 6ширхэг）



(2) Гэрээт хугацаа

Гэрээт өдрөөс～2010 он 9 сар 3 өдөр

Утааны хэмжилтийн зориулалттай фланецийг хийх

Гүйцэтгэгч нь хавсралтын зурганд үзүүлэх фланецийг хийж гүйцэтгэнэ.

Хийцийн агуулга

① Гадна диаметр нь 80～100мм- тэй төмөр трубааг 150～500мм-ээр таслана.

② Турбаны нэг талд нь, 5k тэгшилсэн трубаан гадна диаметрээр тааруулан фланец гагнаж өгнө.

③ Фланецны хэмжээгээр халуун паранит бэлтгэнэ.

④ Фланецтай адил хэмжээ бүхий төмөр хавтан зүсэж тааруулан фланецны нүхтэй адил хэмжээнд нүхэлсэн таг хийнэ.

⑤ Фланжны боолтны нүхэнд таарах боолт （14～18ммφ-ийн боолт） болон гайкнуудийг боолтны нүхний тоогоор бэлдэнэ.

⑥ Хавсралт зургийн дагуу угсарна.

(3) Хийх төлөвлөгөөний шийдэл

Гүйцэтгэгч нь доорхи зүйлсийг хамруулсан гүйцэтгэлийн төлөвлөгөөг гаргаж захиалагчид хүргүүлнэ.

- Гүйцэтгэлийн явцын хүснэгт
- Бүтээмжийн зохион байгуулалтын хүснэгт（Ажлын хэсгийн бүдүүвч・агуулга болон хариуцагч）
- Бусад хэрэгтэй гэсэн зүйл

(4) Ажил үүргийн хяналт

- Гүйцэтгэгч нь захиалагчтай холбоотойгоор ажлыг явуулна.

(5) Зардлын зохицуулалт

Утааны хэмжилтийн зориулалттай фланж хийхэд шаардлагатай хүн хүч, материал, бусад зарцуулах материалын зардлыг гүйцэтгэгч тал бүрэн хариуцна.

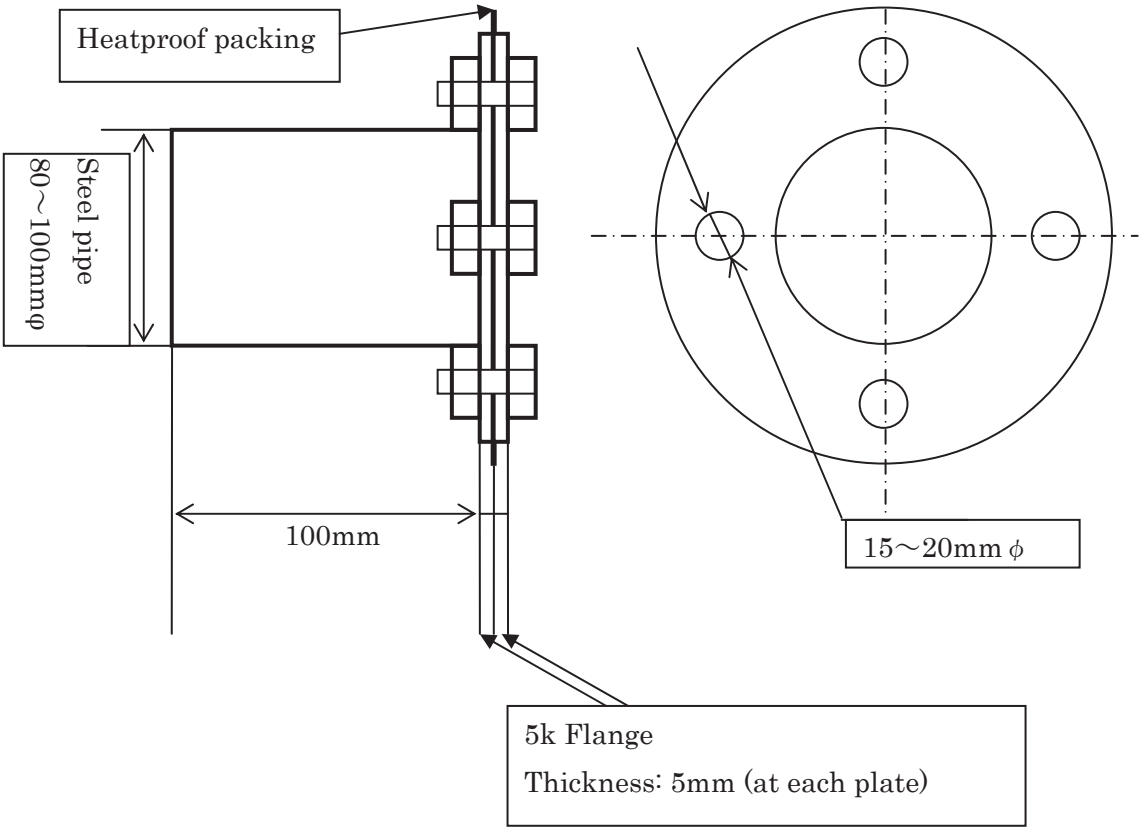
2.2 Эргэлзээ

Гүйцэтгэгч нь ажил гүйцэтгэлийн явцад эргэлзээ үүссэн тохиолдолд захиалагчтай зөвшилцний үндсэн дээр гүйцэтгэнэ.

2.3 Бэлэн болсон бүтээгдхүүн

- Гүйцэтгэгч нь бүтээгдхүүнийг хүргүүлж өгч захиалагчаар шалгуулан зөвшөөрүүлсэн байх.
- Бүтээгдхүүн нь захиалагчийн заасан газарт гүйцэтгэгч нь хүргэж өгсөн байх.

Drawing of Flange for Flue Gas Measurement



Remarks

In the case of concrete or brick stack:

Length of flanges have to be decided based upon the thickness of the each stack wall after making a hole there. And flanges have to be installed as shown in the drawing below.

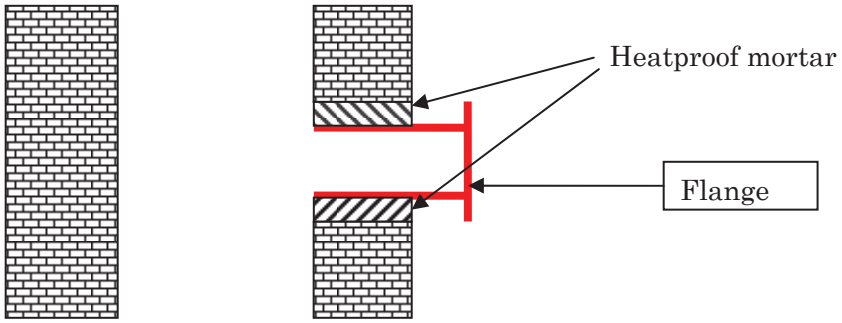


Fig. Cross Section of stack made of brick or concrete

Утааны хэмжилтийн зориулалттай фланж суурьлуулах ажиллагааг гүйцэтгүүлэх ажлын даалгавар

1. Утааны хэмжилтийн фланц суурилуулах зорилго

Утааны хэмжилтийн фланц суурилуулах зорилго нь УБ хотод байгаа УХЗ-аас гарч буй хаягдал хий утаан дахь бохирдуулах бодисын агууламжийг хэмжихийн тулд багаж төхөөрөмжийг яндан руу оруулах хэмжилтийн нүх гаргахад оршино.

2. Гүйцэтгүүлэх ажлын агуулга

2.1 Утааны хэмжилтийн зориулалттай фланцны суурилуулалт

Гүйцэтгэгч нь УБ хотын доторх захиалагчийн товлосон УХЗ-ны яндан эсвэл утааны замд хэмжилтийн зориулалттай фланцийг суурилуулалтыг хийнэ.

(1) Үйл ажиллагааны нутаг дэвсгэр

Улаанбаатар хот

(2) Гэрээт хугацаа

Гэрээ хийсэн өдөр ～2010он 9 сар30өдөр

(3) Утааны хэмжилтийн зориулалттай фланц суурилуулалт

Гүйцэтгэгч нь захиалагчийн товлосон УХЗ-ны яндан эсвэл утаан замд захиалагчийн тэмдэглэсэн газарт захиалагчийн бэлтгэсэн утааны хэмжилтийн зориулалттай фланжийг төмөр янданд гагнаж, тоосго болон бетон байх үед халуун тэсвэртэй зуурмаг ашиглан суурилуулна.

Суурилуулалтын аргачлалын дэлгэрэнгүйг хавсралтанд үзүүлэв.

Суурилуулалтанд анхаарах зүйл

① Гүйцэтгэлийн газар нь дээвэр дээр байрлах үе байх учраас 4м-тэй шат бэлтгэх

② Фланц суурилуулах газар нь 3-м-ээс дээр байрлах тул өндөр газарт ажиллах зориулалт бүхий тавцан бэлгэх

③ Янданг нүхэлснээс болоод яндан нь нурчихгүй байх тал дээр анхаарч, нурчих магадлалтай болсон үед ажлаа зогсоож захиалагч болон НАЧА-нд мэдэгдэж зааварчилгаа авах

④ Суурилуулсны дараа баримтжуулсан зургийг ойроос болон холоос авах

(4) Хийх төлөвлөгөөний шийдэл

Гүйцэтгэгч нь доорхи зүйлсийг хамруулсан гүйцэтгэлийн төлөвлөгөөг гаргаж захиалагчид хүргүүлнэ

- Гүйцэтгэлийн явцын хүснэгт
- Бүтээмжийн зохион байгуулалтын хүснэгт（Ажлын хэсгийн бүдүүвч・агуулга болон хариуцагч）
- Бусад хэрэгтэй гэсэн зүйл

(5) Зуух эзэмшигч болон тухайн газар руу нэвтрэх зөвшөөрөл

Гүйцэтгэгч нь утааны хэмжилтийн зориулалттай фланцийг суурилуулахад шаардлагатай холбогдох албан тушаалтны зөвшөөрлийг урьдчилан НАЧА-аас гаргуулж авна. Мөн утааны хэмжилтийн зориулалттай фланц суурилуулахад албаны, нийтийн, хувийн эзэмшил газарт нэвтрэх үед гүйцэтгэгч нь холбогдох хүмүүстэй таарамжтай харьцааг хадгалан, төвөг учруулалгүй ажлаа гүйцэтгэнэ.

(6) Фланц суурилуулах ажиллагаа

- Гүйцэтгэгч нь захиалагчийн сонгосон УХЗ-ны янданд захиалагчаас өгөх фланцийг захиалагчийн тэмдэглэсэн газарт өгөгдлийн дагуу нүх гаргаж төмөр янданд цахилгаан гагнуурар гагнаж, тоосго болон бетон янданд халуун тэсвэртэй зуурмагаар бөхөлж өгнө.
- Суурилуулах газар 20 байна
- Гүйцэтгэгч нь утааны хэмжилтийн зориулалттай фланц суурилуулхаас өмнөх болон дараах байдлын зураг авч захиалагч ид бичгээр болон файлаар（CD зэрэг）гүйцэтгэлийн бодит байдлыг тайлагнана.
- Гүйцэтгэгчийн фланц суурилуулалтын ажилд НАЧА-аас хамт явна.

(7) Ажиллагааны хяналт

- Гүйцэтгэгч нь тогтмол захиалагчтай холбоотойгоор ажилаа явуулж тодорхой үе шат бүртээ захиалагчид мэдээлэн түүний дараа ажлын заавар авч ажиллана. Мөн судалгаанд нэн шаардлагатай гэж үзсэн тохиолдолд захиалагч талтай хэлэлцэж урьдчилан зөвшөөрөл авна.
- Гүйцэтгэгч нь фланц суурилуулалтын гүйцэтгэх ажлын явцдаа аваар осолгүй байх тал дээр хичээж ажиллана. Осол гарсан тохиолдолд тэр тухайгаа захиалагчид мэдээлэх ба гарсан хохирлыг гүйцэтгэгч тал бүрэн хариуцна.

(8) Зардлын зохицуулалт

Утааны хэмжилтийн зориулалттай фланц суурилуулахад шаардлагатай хүн хүч, унаа, материал, бусад үрэгдэх материалын зардлыг гүйцэтгэгч тал бүрэн хариуцна.

2.2 Эргэлзээ

Гүйцэтгэгч нь ажил гүйцэтгэлийн явцад эргэлзээ үүссэн тохиолдолд захиалагчтай зөвшилцсний үндсэн дээр гүйцэтгэнэ.

2.3 Бэлэн болсон бүтээгдхүүн

- Гүйцэтгэгч нь хувиарын дагуу бүтээгдхүүнийг хүргүүлж өгч захиалагчаар шалгуулан зөвшөөрүүлсэн байх
- Захиалагч нь гүйцэтгэсэн ажлаа хүлээлгэх үедээ захиалагч талыг оролцуулах

Хавсралт2.2-4 Утааны хийн хэмжилтийн дүн

[H-R-1] HOB measurement result

Measurement Date			24-Nov-10	25-Nov-10	30-Nov-10	2-Dec-10	14-Dec-10			23-Dec-10		24-Jan-11		
General information	Place		Childcare	Train Repair	NO.39school	Bosa	Train Repair			Childcare		NO.310 Army		
	Type of boiler		MUHT	BZUI-100	DZL-1.4	RJG-18	BZUI-100			MUHT		HP-18-54		
	Capacity	MW	0.7	0.85	1.4	-	0.85			0.7		0.73		
	Cross sectional area of duct	m2	0.20	0.64	0.11	0.16	0.64			0.20		0.65		
	Type of coal		Nalaikh (crushed)	Shiveovoo	Nalaikh (crushed)	Nalaikh (crushed)	Shiveovoo (lump + crushed)			Nalaikh (crushed)		Nalaikh (crushed)		
Operational condition	Velocity of flue gas *1	m/s	-	-	15.6	7.2	13.6	12.7	15.6	10.2	8.9	3.9	4.4	2.5
	Temperature of flue gas *1	℃	-	-	66	198	145	190	234	110	103	134	148	131
	Water vapor concentration *1	%	-	-	30.0	12.1	5.5			2.8		1.7		
	Flow rate of wet flue gas	Nm3/h	-	-	4,200	2,100	17,900	15,100	16,900	2,800	2,600	5,300	5,800	3,500
	Flow rate of dry flue gas	Nm3/h	-	-	2,900	1,700	17,000	14,000	16,000	2,700	2,500	5,200	5,700	3,400
	Ave. flow rate of dry flue gas	Nm3/h	-	-	2,900	1,700	16,000			2,600		4,800		
	Coal feed rate	kg/h	-	-	228	138	672			394	266	223		
	O2 concentration *2	%	-	-	16.1	14.0	18			17.5		18.4		
	CO2 concentoration *2	%	-	-	2.8	6.1	2.8			3.0		2.3		
	CO concentoration *2	ppm	-	-	370	610	200			130		480		
Measured concentration (Raw data)	Dust concentration	g/Nm3	-	1.0	0.028	2.1	1.8	1.8	4.5	1.2	0.70	0.55	0.16	0.037
	Average dust concentration	g/Nm3	-	1.0	0.028	2.1	2.7			1.0		0.25		
	SO2 (ppm) *2	ppm	-	-	125	412	95			-		94		
	NOX (ppm) *2	ppm	-	-	49	78	32			-		35		

Emission Factor	Dust	kg/t	-	-	0.35	25	64			8.3	6.6	5.3		
	SO2	kg/t	-	-	4.5	14.5	6.5			-		5.8		
	NOX *3	kg/t	-	-	0.8	1.3	1.0			-		1.0		
	CO	kg/t			5.9	9.4	6.0			1.32		12.9		
Dust sampling method			-	Trial	Trial	Trial	Trial			Trial		20min×3		

*1 30min average value
*2 Average values measured by TESTO
*3 NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	-	-	0.065	3.4	9.8			3.2		1.1		
	SO2	ppm	-	-	298	687	346			-		421		
	NOX	ppm	-	-	117	130	117			-		156		
	CO				880	1000	730			430		2200		
Emission Standard Value (MNS)	Dust	g/Nm3	0.4	0.3	0.3	0.4	0.3			0.4		0.4		
	SO2	ppm	280	210	210	280	210			280		280		
	NOX	ppm	336	299	299	336	299			336		336		
	CO		2000	1600	1600	2000	1600			2000		2000		

*4 Data in 'Emission Concentraion' table above are currently provided for reference purpose only at May 2011, because only a few instantaneous measured values are gained by Testo, exhaust gas analyzer, to calculate the average data for one measurement task, and not averaged from long time measurement values.
Therefore, it is not recommendable to use the data in 'Emission Concentration' table for evaluating the pollution level of each emission source by compairing with 'Emission Standard' value.

[H-R-1] HOB measurement result

Measurement Date			26-Jan-11				28-Jan-11				31-Jan-11	1-Feb-11		
General information	Place		NO.310 Army				NO.310 Army				Bosa	Bosa		
	Type of boiler		HP-18-54				HP-18-54				RJG-18	RJG-18		
	Capacity	MW	0.73				0.73				-	-		
	Cross sectional area of duct	m2	0.65				0.65				0.16	0.16		
	Type of coal		Nalaikh (crushed)				Nalaikh (crushed)				Nalaikh (crushed)	Nalaikh (crushed)		
Operational condition	Velocity of flue gas *1	m/s	4.0	3.3	3.5	4.0	7.6	8.2	8.4	8.5	7.8	7.2	7.6	7.2
	Temperature of flue gas *1	℃	156	151	145	142	152	149	161	179	279	291	261	200
	Water vapor concentration *1	%	1.6				1.2				4.9	6.6		
	Flow rate of wet flue gas	Nm3/h	5,200	4,400	4,700	5,400	10,200	10,900	11,000	10,600	3,400	1,700	1,900	2,100
	Flow rate of dry flue gas	Nm3/h	5,200	4,300	4,700	5,300	10,000	11,000	11,000	11,000	3,300	1,600	1,800	2,000
	Ave. flow rate of dry flue gas	Nm3/h	4,900				11,000				3,300	1,800		
	Coal feed rate	kg/h	222				167				-	86		
	O2 concentration *2	%	18.9				17.9				15.5	14.6		
	CO2 concentoration *2	%	1.9				2.8				4.8	5.6		
	CO concentoration *2	ppm	530				600				1500	780		
Measured concentration (Raw data)	Dust concentration	g/Nm3	0.32	0.53	0.32	0.25	0.37	0.14	0.16	0.58	-	11	12	19
	Average dust concentration	g/Nm3	0.35				0.31				-	14		
	SO2 (ppm) *2	ppm	-				137				-	-		
	NOX (ppm) *2	ppm	-				51				-	-		

Emission Factor	Dust	kg/t	7.8				20				-	295		
	SO2	kg/t	-				25.8				-	-		
	NOX *3	kg/t	-				4.5				-	-		
	CO	kg/t	14.6				49				-	20.3		
Dust sampling method			20min×4				20min×4				-	3 batches		

*1 30min average value
*2 Average values measured by TESTO
*3 NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	2.0				1.2				-	26		
	SO2	ppm	-				509				-	-		
	NOX	ppm	-				190				-	-		
	CO		2900				2200				3200	1400		
Emission Standard Value (MNS)	Dust	g/Nm3	0.4				0.4				0.4	0.4		
	SO2	ppm	280				280				280	280		
	NOX	ppm	336				336				336	336		
	CO		2000				2000				2000	2000		

*4 Data in 'Emission Concentraion' table above are currently provided for reference purpose only at May 2011, because only a few instantaneous measured values are gained by Testo, exhaust gas analyzer, to calculate the average data for one measurement task, and not averaged from long time measurement values.
Therefore, it is not recommendable to use the data in 'Emission Concentration' table for evaluating the pollution level of each emission source by compairing with 'Emission Standard' value.

[H-R-1] HOB measurement result

Measurement Date			10-Feb-11				11-Feb-11				16-Feb-11			
General information	Place		NO.113 secondary school				NO.113 secondary school				BOSA			
	Type of boiler		MDZ-0.25				MDZ-0.25				RJG-18			
	Capacity	MW	0.25				0.25				-			
	Cross sectional area of duct	m2	0.085				0.085				0.16			
	Type of coal		Nalaikh (lump)				Nalaikh (lump)				Nalaikh (crushed)			
Operational condition	Velocity of flue gas *1	m/s	3.5	3.2	5.3	4.9	5.2	5.0	4.2	5.1	7.1	6.9	7.7	7.0
	Temperature of flue gas *1	℃	298	259	262	283	257	230	171	164	221	218	281	245
	Water vapor concentration *1	%	2.7				11.7				5.9			
	Flow rate of wet flue gas	Nm3/h	440	440	730	660	730	730	700	850	2,000	1,900	1,900	1,900
	Flow rate of dry flue gas	Nm3/h	440	440	700	630	630	630	600	760	1,800	1,800	1,800	1,800
	Ave. flow rate of dry flue gas	Nm3/h	550				660				1,800			
	Coal feed rate	kg/h	69				86				144			
	O2 concentration *2	%	15.5				17.9				13.1			
	CO2 concentoration *2	%	4.6				2.7				6.0			
	CO concentoration *2	ppm	430				150				1,800			
Measured concentration (Raw data)	Dust concentration	g/Nm3	0.79	1.1	0.86	0.26	0.18	0.12	0.10	0.32	12	8	18	14
	Average dust concentration	g/Nm3	0.8				0.18				13			
	SO2 (ppm) *2	ppm	753				408				108			
	NOX (ppm) *2	ppm	188				31				70			

Emission Factor	Dust	kg/t	6.0	1.4	162
	SO2	kg/t	17.1	9.0	3.9
	NOX *3	kg/t	2.0	0.3	1.2
	CO	kg/t	4.3	1.44	28.1
Dust sampling method			20min×4	20min×4	3 batches

*1 30min average value
*2 Average values measured by TESTO
*3 NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	1.6	0.67	19
	SO2	ppm	1586	1516	159
	NOX	ppm	396	115	103
	CO		910	557	2600
Emission Standard Value (MNS)	Dust	g/Nm3	0.4	0.4	0.4
	SO2	ppm	280	280	280
	NOX	ppm	336	336	336
	CO		2000	2000	2000

*4 Data in 'Emission Concentraion' table above are currently provided for reference purpose only at May 2011, because only a few instantaneous measured values are gained by Testo, exhaust gas analyzer, to calculate the average data for one measurement task, and not averaged from long time measurement values.
Therefore, it is not recommendable to use the data in 'Emission Concentration' table for evaluating the pollution level of each emission source by compairing with 'Emission Standard' value.

[H-R-1] HOB measurement result

Measurement Date			23-Feb-11		24-Feb-11			1-Mar-11			2-Mar-11		
General information	Place		NO.41secondary school		NO.41 secondary school			No.46 school			No 39 school		
	Type of boiler		MUHT		MUHT			KCR-300			DZL 1,4-0,7/95/70A		
	Capacity	MW	0.7		0.7			-			1.4		
	Cross sectional area of duct	m2	0.064		0.064			0.028			0.13		
	Type of coal		Nalaikh (lump)		Nalaikh (lump)			Nalaikh (lump)			Nalaikh (crushed)		
Operational condition	Velocity of flue gas *1	m/s	17.5	12.4	14.7	14.7	14.9	10.0	12.4	10.6	6.4	5.7	6.4
	Temperature of flue gas *1	℃	207	373	195	178	199	182	276	196	106	109	114
	Water vapor concentration *1	%	4.2		3.8			5.7			2.5		
	Flow rate of wet flue gas	Nm3/h	2,000	1,000	1,700	1,800	1,700	540	540	540	1,800	1,600	1,800
	Flow rate of dry flue gas	Nm3/h	1,900	1,000	1,600	1,700	1,600	510	510	510	1,800	1,600	1,700
	Ave. flow rate of dry flue gas	Nm3/h	1,500		1,600			510			1,700		
	Coal feed rate	kg/h	281		231			74			104		
	O2 concentration *2	%	17.5		19.3			14.4			16.8		
	CO2 concentoration *2	%	3.4		1.9			6			3.8		
	CO concentoration *2	ppm	340		330			16,000			178		
Measured concentration (Raw data)	Dust concentration	g/Nm3	0.55	0.67	0.19	0.18	0.27	0.39	0.23	0.019	0.034	0.021	0.032
	Average dust concentration	g/Nm3	0.6		0.21			0.22			0.029		
	SO2 (ppm) *2	ppm	94		31			93			52		
	NOX (ppm) *2	ppm	36		24			47			30		

Emission Factor	Dust	kg/t	3.2	1.48	1.49	0.48
	SO2	kg/t	1.43	0.60	1.84	2.41
	NOX *3	kg/t	0.25	0.225	0.44	0.65
	CO	kg/t	2.27	2.86	138	3.6
Dust sampling method			Many Batches	3 batches	1 batch	

*1 30min average value
*2 Average values measured by TESTO
*3 NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	2.0	1.5	0.38	0.082
	SO2	ppm	312	214	165	144
	NOX	ppm	119	166	83	83
	CO		1100	2300	28000	500
Emission Standard Value (MNS)	Dust	g/Nm3	0.4	0.4	0.4	0.3
	SO2	ppm	280	280	280	210
	NOX	ppm	336	336	336	299
	CO		2000	2000	2000	1600

*4 Data in 'Emission Concentraion' table above are currently provided for reference purpose only at May 2011, because only a few instantaneous measured values are gained by Testo, exhaust gas analyzer, to calculate the average data for one measurement task, and not averaged from long time measurement values.
Therefore, it is not recommendable to use the data in 'Emission Concentration' table for evaluating the pollution level of each emission source by compairing with 'Emission Standard' value.

[H-R-1] HOB measurement result

Measurement Date			3-Mar-11			8-Mar-11			9-Mar-11			11-Mar-11		
General information	Place		No.104 school			Burd center			No.106 school			No 10 secondary school		
	Type of boiler		WWGS 035			LSG-0.2			Thrmocholor-0.3			MWB-1		
	Capacity	MW	0.35			-			-			1.0		
	Cross sectional area of duct	m2	0.068			0.13			0.096			0.50		
	Type of coal		Nalaikh (crushed)			Nalaikh (lump)			Nalaikh (crushed)			Nalaikh (crushed)		
Operational condition	Velocity of flue gas *1	m/s	7.9	2.7	3.9	6.6	6.9	2.1	6.5	5.3	5.2	6.6	6.4	6.5
	Temperature of flue gas *1	℃	128	127	117	467	310	191	86	74	48	161	162	161
	Water vapor concentration *1	%	9.8			5.9			2.32			2.3		
	Flow rate of wet flue gas	Nm3/h	1,100	380	570	1,100	1,500	600	1,500	1,200	1,300	6,500	6,500	6,400
	Flow rate of dry flue gas	Nm3/h	1,000	350	510	1,100	1,400	570	1,500	1,200	1,300	6,300	6,400	6,300
	Ave. flow rate of dry flue gas	Nm3/h	620			1,000			1,300			6,300		
	Coal feed rate	kg/h	85			24			57			750		
	O2 concentration *2	%	12.0			10.3			14.5			16		
	CO2 concentoration *2	%	7.8			10			5.7			4.3		
	CO concentoration *2	ppm	26,170			1,250			13,670			580		
Measured concentration (Raw data)	Dust concentration	g/Nm3	0.078	0.024	0.14	0.11	0.030	0.41	3.3	1.7	2.0	2.5	3.6	2.2
	Average dust concentration	g/Nm3	0.082			0.18			2.3			2.7		
	SO2 (ppm) *2	ppm	41			240			19			183		
	NOX (ppm) *2	ppm	73			88			58			48		

Emission Factor	Dust	kg/t	0.59	7.6	53	23
	SO2	kg/t	0.85	28.6	1.3	4.4
	NOX *3	kg/t	0.71	4.9	1.8	0.54
	CO	kg/t	239	65	390	6.1
Dust sampling method			3 batches	3 batches	2 batches	3 batches

*1 30min average value
*2 Average values measured by TESTO
*3 NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	0.11	0.20	4.2	6.2
	SO2	ppm	53	261	35	410
	NOX	ppm	95	96	103	107
	CO		34000	1400	25000	1300
Emission Standard Value (MNS)	Dust	g/Nm3	0.4	0.4	0.3	0.3
	SO2	ppm	280	280	210	210
	NOX	ppm	336	336	299	299
	CO		2000	2000	1600	1600

*4 Data in 'Emission Concentraion' table above are currently provided for reference purpose only at May 2011, because only a few instantaneous measured values are gained by Testo, exhaust gas analyzer, to calculate the average data for one measurement task, and not averaged from long time measurement values.
Therefore, it is not recommendable to use the data in 'Emission Concentration' table for evaluating the pollution level of each emission source by compairing with 'Emission Standard' value.

[H-R-1] HOB measurement result

Measurement Date			15-Mar-11			16-Mar-11		
General information	Place		No 71 school			No 92 secondagy school		
	Type of boiler		DLIIRSH 170-80/55-AII*AIII			MDZ-800		
	Capacity	MW	0.17			0.8		
	Cross sectional area of duct	m2	0.085			0.064		
	Type of coal		Baganuur (lump)			Baganuur (lump + crushed)		
Operational condition	Velocity of flue gas *1	m/s	6.8	1.7	5.6	6.2	6.2	6.4
	Temperature of flue gas *1	℃	284	168	209	129	84	57
	Water vapor concentration *1	%	6.3			5.46		
	Flow rate of wet flue gas	Nm3/h	880	280	850	3,400	3,900	4,300
	Flow rate of dry flue gas	Nm3/h	820	250	790	3,300	3,700	4,100
	Ave. flow rate of dry flue gas	Nm3/h	620			3,700		
	Coal feed rate	kg/h	48			138		
	O2 concentration *2	%	11			12.9		
	CO2 concentoration *2	%	9.0			7.1		
	CO concentoration *2	ppm	400			1,040		
Measured concentration (Raw data)	Dust concentration	g/Nm3	0.28	0.071	0.69	1.1	0.10	0.30
	Average dust concentration	g/Nm3	0.35			0.49		
	SO2 (ppm) *2	ppm	47			89		
	NOX (ppm) *2	ppm	123			118		

Emission Factor	Dust	kg/t	4.5	13.2
	SO2	kg/t	1.75	6.8
	NOX *3	kg/t	2.13	4.2
	CO	kg/t	6.5	35
Dust sampling method			3 batches	2 batches

*1 30min average value
*2 Average values measured by TESTO
*3 NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	0.40	0.7
	SO2	ppm	54	128
	NOX	ppm	141	170
	CO		460	1500
Emission Standard Value (MNS)	Dust	g/Nm3	0.4	0.4
	SO2	ppm	280	280
	NOX	ppm	336	336
	CO		1600	2000

*4 Data in 'Emission Concentraion' table above are currently provided for reference purpose only at May 2011, because only a few instantaneous measured values are gained by Testo, exhaust gas analyzer, to calculate the average data for one measurement task, and not averaged from long time measurement values.
Therefore, it is not recommendable to use the data in 'Emission Concentration' table for evaluating the pollution level of each emission source by compairing with 'Emission Standard' value.

[P-R-1] Measurement results of NO.2 Power Plant

Measurement Date			19-Jan				21-Jan				17-Feb				18-Feb			
No. of boiler			NO.5(75t/h)				NO.3(35t/h)				NO.4(75t/h)				NO.5(75t/h)			
Cross sectional area of duct		m2	1.50		1.61		1.81		1.81		1.40		1.40		1.50		1.61	
Type of coal			Buganuur		Buganuur		Buganuur		Buganuur		Buganuur		Buganuur		Buganuur		Buganuur	
Measurement duct			before scrubber		after scrubber		before scrubber		after scrubber		before scrubber		after scrubber		before scrubber		after scrubber	
			left duct	right duct	left duct	right duct	left duct	right duct	left duct	right duct	right duct	left duct	right duct	left duct	right duct	left duct	right duct	left duct
Operational condition	Velocity of flue gas	m/s	19.4	12.3	14.0	13.8	5.5	9.4	8.2	7.3	-	-	17.7	15.4	17.6	18.6	12.7	15.4
	Temperature of flue gas	℃	145	-	120	-	157	-	146	-	-	-	120	122	150	150	132	132
	Water vapor concentration	%	9.7	-	10.0	-	11.1	-	11.1	-	-	-	10.6	9.8	11.0	11.0	9.8	9.8
	Flow rate of wet flue gas	Nm3/h	59,000	38,000	49,000	48,000	19,900	34,000	29,300	26,900	-	-	53,000	46,000	52,000	55,000	43,000	52,000
	Flow rate of dry flue gas	Nm3/h	53,000	34,000	44,000	43,000	17,700	30,200	26,100	23,900	-	-	47,000	42,000	47,000	49,000	38,000	46,000
	Total flow rate of dry flue gas	Nm3/h	87,000		87,000		47,900		50,000		-		89,000		96,000		84,000	
	Coal feed rate	kg/h	17,110				10,580				17,830				20,630			
	O2 concentration	%	14.2	-	6.8	-	6.4	-	8.5	-	-	-	7.6	-	-	8.4	-	11.4
	CO2 concentoration	%	6.0	-	12	-	12	-	11	-	-	-	12	-	-	11	-	8.4
	CO concentoration	ppm	58	-	6,200	-	29,000	-	7,000	-	-	-	200	-	-	3,500	-	1,300
Dust (Raw data)	Dust concentration	g/m3N	1.4	9	1.1	1.1	18	11	7.1	2.6	-	-	1.6	1.5	11	11	1.7	1.7
	Average of Dust concentration	g/m3N	5.3		1.1		15		4.8		-		1.5		11		1.7	
	Efficiency of de-dust	%	78.4%				67.1%				-				84.2%			
Gas (Raw data)	NOX concentration	ppm	88	-	-	-	103	-	109	-	-	-	141	148	-	116	-	117
	SO2 concentration	ppm	94	-	-	-	251	-	245	-	-	-	88	88	-	133	-	117
	Measurement time	-	14:55	-	11:50	-	14:50	-	11:49	-	-	-	11:50	12:08	-	11:00	-	10:10

Emission Factor	Dust factor for each duct	kg/t	-		2.9	2.8	-		18	5.8	-		4.2	3.4	25	25	3.2	3.8
	Dust factor as a boiler	kg/t	-		5.8		-		23		-		7.6		-		7.0	
	SO2	kg/t	-		-		-		3.3		-		1.26		-		1.5	
	NOX	kg/t	-		-		-		0.69		-		0.97		-		0.64	
	CO	kg/t	-		39		-		41		-		1.25		-		6.6	
Emission Concentration after O2 conversion at 6%	Dust	g/Nm3	1.2				5.8				1.7				2.7			
	SO2	ppm	-				294				98				182			
	NOX	ppm	-				131				162				182			
	CO	ppm	6500				8400				220				2000			
Emission Standard Value (MNS)	Dust	g/Nm3	21				10.6				21				21			
	SO2	ppm	676.1				619.5				676.1				676.1			
	NOX	ppm	948.3				530.1				948.3				948.3			
	CO	ppm	2838				70				2838				2838			
Remarks																		

* Data in 'Emission Concentraion' table above are currently provided for reference purpose only at May 2011, because only a few instantaneous measured values are gaine by Testo, exhaust gas analyzer, to calculate the average data for one measurement task, and not averaged from long time measurement values.
Therefore, it is not recommendable to use the data in 'Emission Concentration' table for evaluating the pollution level of each emission source by compairing with 'Emission Standard' value.

[P-R-1] Measurement results of NO.3 Power Plant

Measurement Date			7-Dec				9-Dec				16-Dec				17-Dec			
No. of boiler			NO.10(220t/h)				NO.7(220t/h)				NO.6(75t/h)				NO.4(75t/h)			
Cross sectional area of duct		m2	5.07		3.72		5.07		3.72		2.36		1.88		2.12		1.44	
Type of coal			Buganuur		Buganuur		Buganuur		Buganuur		Buganuur		Buganuur		Buganuur		Buganuur	
Measurement duct			before scrubber		after scrubber		before scrubber		after scrubber		before scrubber		after scrubber		before scrubber		after scrubber	
			left duct	right duct	left duct	right duct	left duct	right duct	left duct	right duct	left duct	right duct	left duct	right duct	left duct	right duct	left duct	right duct
Operational condition	Velocity of flue gas	m/s	12.1	11.2	12.0	10.6	13.8	11.5	7.2	9.6	10.3	8.2	11.3	11.1	10.8	11.6	16.1	23.6
	Temperature of flue gas	℃	172	-	73	-	215	-	98	-	-	116	84	-	127	-	83	-
	Water vapor concentration	%	7.3	-	39.7	-	10.6	-	5.7	5.1	14.4	15.5	14.0	-	11.5	9.4	14.7	12.4
	Flow rate of wet flue gas	Nm3/h	116,000	107,000	108,000	95,000	120,000	100,000	60,000	80,000	53,000	42,000	50,000	49,000	48,000	52,000	54,000	79,000
	Flow rate of dry flue gas	Nm3/h	110,000	100,000	65,000	58,000	107,000	89,000	57,000	76,000	45,000	35,000	43,000	42,000	43,000	47,000	46,000	69,000
	Total flow rate of dry flue gas	Nm3/h	210,000		123,000		196,000		133,000		80,000		85,000		90,000		115,000	
	Coal feed rate	kg/h	26,820				33,021				13,528				12,714			
	O2 concentration	%	9.5	-	-	-	3.7	4.2	-	-	-	2.4	4.3	-	9.7	-	4.2	-
	CO2 concentoration	%	10	-	-	-	15	15	-	-	-	16	15	-	10	-	15	-
	CO concentoration	ppm	0	-	-	-	0	-	-	-	-	16,000	1,400	-	110	-	11,000	-
Dust (Raw data)	Dust concentration	g/Nm3	5.5	5.1	0.22	0.53	11.2	11.9	0.79	0.73	8.5	11.2	0.65	0.34	19.5	18.1	0.57	1.2
	Average of Dust concentration	g/Nm3	5.3		0.38		11.6		0.76		9.8		0.49		18.8		0.89	
	Efficiency of de-dust	%	92.9				93.4				95.0				95.3			
Gas (Raw data)	NOX concentration	ppm	210	-	-	-	494		-	-	-	-	-	-	189	-	164	-
	SO2 concentration	ppm	329	-	-	-	465	-	-	-	-	-	-	-	199	-	236	-
	Measurement time		11:43	-	14:38	-	11:00	11:20	15:10	-	-	13:37	10:50	-	13:40	-	10:45	-

Emission Factor	Dust factor for each duct	kg/t	-		0.53	1.2	-		1.36	1.68	-		2.07	1.05	-		2.1	6.5
	Dust factor as a boiler	kg/t	-		1.7				3.0				3.1				8.6	
	SO2	kg/t	-		-		-		-		-		-		-		6.1	
	NOX	kg/t	-		-		-		-		-		-		-		1.99	
	CO	kg/t											11.0				124	
Emission Concentration after O2 conversion at 6%	Dust	g/Nm3	0.49				0.67				0.42				0.95			
	SO2	ppm	-				-				-				252			
	NOX	ppm	-				-				-				175			
	CO	ppm									1300				12000			
Emission Standard Value (MNS)	Dust	g/Nm3	10.8				10.8				21				1.2			
	SO2	ppm	519.8				519.8				676.1				215.3			
	NOX	ppm	821.3				821.3				948.3				238.9			
	CO	ppm	240				240				2838				4996			
Remarks															Fluidized bed furnace			

* Molecular weight of NO is used for converting the NOx unit from ppm to mg/m3

* Data in 'Emission Concentraion' table above are currently provided for reference purpose only at May 2011, because only a few instantaneous measured values are gained by Testo, exhaust gas analyzer, to calculate the average data for one measurement task, and not averaged from long time measurement values.
Therefore, it is not recommendable to use the data in 'Emission Concentration' table for evaluating the pollution level of each emission source by compairing with 'Emission Standard' value.

[P-R-1] Measurement results of NO.4 Power Plant

Measurement Date			1-Sep-10					2-Sep-10					7-Sep-10				
No. of boiler			NO.1					NO.2					NO.4				
Cross sectional area of duct		m2	3.50	3.50	3.50	3.50	11.99	3.50	3.50	3.50	3.50	11.99	3.50	3.50	3.50	3.50	11.99
Type of coal			Baganuur					Baganuur					Baganuur				
Measurement duct			before EP				after EP	before EP				after EP	before EP				after EP
			left1 duct	left2 duct	right2 duct	right1 duct	duct	left1 duct	left2 duct	right2 duct	right1 duct	duct	left1 duct	left2 duct	right2 duct	right1 duct	duct
Operational condition	Velocity of flue gas	m/s	13.8	17.4	18.6	14.2	18.0	19.5	18.8	17.2	16.5	18.8	16.2	19.2	18.2	15.8	19.1
	Temperature of flue gas	℃	151	174	161	135	151	151	165	156	154	149	151	168	165	133	140
	Water vapor concentration	%	11.2	12.4	10.2	5.5	9.8	8.1	9.5	9.1	10.4	9.3	10.6	10.6	10.6	10.6	10.6
	Flow rate of wet flue gas	Nm3/h	100,000	130,000	110,000	100,000	420,000	110,000	120,000	130,000	140,000	440,000	110,000	120,000	130,000	110,000	470,000
	Flow rate of dry flue gas	Nm3/h	96,000	110,000	100,000	85,000	380,000	100,000	110,000	110,000	120,000	400,000	100,000	110,000	120,000	100,000	420,000
	Coal feed rate	kg/h	62,560					74,000					73,500				
	O2 concentration	%	4.6	3.7	5.7	8.6	6.6	3.6	5.2	4.9	5.9	5.7	5.3	4.2	3.6	6.6	5.9
	CO2 concentoration	%	14	15	13	11	13	15	14	14	13	13	14	15	15	13	13
	CO concentoration	ppm	4	4.8	4	4.8	3	8	3	2	2	4	4	2	2	4	3
Dust (Raw data)	Dust concentration	g/Nm3	10	13	0.57	0.41	0.30	3.8	3.3	3.7	3.1	0.0028	5.8	5.2	3.9	5.9	0.036
	Average of Dust concentration	g/Nm3	6.0				0.30	3.4				0.0028	5.2				0.036
	Efficiency of de-dust	%	95.0					99.9					99.3				
Gas (Raw data)	NOX concentration	ppm	386	359	367	429	383	-	-	-	-	-	390	385	374	350	385
	SO2 concentration	ppm	31	58	7	3	58	-	-	-	-	-	190	182	155	49	134
	Measurement time		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Emission Factor	Dust	kg/t	-				1.8	-				0.02	-				0.2
	SO2	kg/t	-				1.0	-				-	-				2.2
	NOX	kg/t	-				3.1	-				-	-				2.9
	CO	kg/t	-				0.0	-				0.0	-				0.0
Emission Concentration after O2 conversion at 6%	Dust	g/Nm3	0.31					0.0027					0.036				
	SO2	ppm	60					-					133				
	NOX	ppm	398					-					382				
	CO	ppm	3					4					3				
Emission Standard Value (MNS)	Dust	g/Nm3	0.2					0.2					0.2				
	SO2	ppm	420					420					420				
	NOX	ppm	533.9					533.9					533.9				
	CO	ppm	144					144					144				

* Data in 'Emission Concentraion' table above are currently provided for reference purpose only at May 2011, because only a few instantaneous measured values are gained by Testo, exhaust gas analyzer, to calculate the average data for one measurement task, and not averaged from long time measurement values.

Therefore, it is not recommendable to use the data in 'Emission Concentration' table for evaluating the pollution level of each emission source by compairing with 'Emission Standard' value.

[P-R-1] Measurement results of NO.4 Power Plant

Measurement Date			8-Sep-10					14-Sep-10				
No. of boiler			NO.5					NO.3				
Cross sectional area of duct		m2	3.50	3.50	3.50	3.50	11.99	3.50	3.50	3.50	3.50	11.99
Type of coal			Shivee ovoo					Baganuur				
Measurement duct			before EP				after EP	before EP				after EP
			left1 duct	left2 duct	right2 duct	right1 duct	duct	left1 duct	left2 duct	right2 duct	right1 duct	duct
Operational condition	Velocity of flue gas	m/s	13.2	20.6	18.8	12.3	19.1	19.5	22.2	21.8	20.2	23.3
	Temperature of flue gas	℃	144	175	164	137	154	142	164	158	147	141
	Water vapor concentration	%	19.7	2.6	0.08	9.3	7.9	5.4	8.4	9.0	4.9	6.9
	Flow rate of wet flue gas	Nm3/h	90,000	120,000	130,000	90,000	440,000	140,000	150,000	150,000	140,000	570,000
	Flow rate of dry flue gas	Nm3/h	80,000	120,000	130,000	70,000	410,000	130,000	140,000	140,000	130,000	530,000
	Coal feed rate	kg/h	84,000					69,100				
	O2 concentration	%	6.1	4.2	4.5	6.4	5.9	6.5	5.2	6.2	7.4	6.7
	CO2 concentoration	%	13	15	14	13	13	13	14	13	12	13
	CO concentoration	ppm	2	1	1	2	2	4	2	2	5	3
Dust (Raw data)	Dust concentration	g/Nm3	7.7	3.9	9.1	7.0	0.093	11	9.3	10	9.5	0.37
	Average of Dust concentration	g/Nm3	6.9				0.093	9.8				0.37
	Efficiency of de-dust	%	98.7					96.2				
Gas (Raw data)	NOX concentration	ppm	522	475	473	473	457	380	309	380	363	376
	SO2 concentration	ppm	643	704	576	671	90	2	109	67	16	0
	Measurement time		-	-	-	-	-	-	-	-	-	-

Emission Factor	Dust	kg/t	-				0.5	-				2.9
	SO2	kg/t	-				1.3	-				0.0
	NOX	kg/t	-				3.0	-				3.9
	CO	kg/t	-				0.0	-				0.0
Emission Concentration after O2 conversion at 6%	Dust	g/Nm3	0.093					0.39				
	SO2	ppm	90					0.0				
	NOX	ppm	456					393				
	CO	ppm	2					3				
Emission Standard Value (MNS)	Dust	g/Nm3	0.2					0.2				
	SO2	ppm	420					420				
	NOX	ppm	533.9					533.9				
	CO	ppm	144					144				

* Data in 'Emission Concentraion' table above are currently provided for reference purpose only at May 2011, because only a few instantaneous measured values are gained by Testo, exhaust gas analyzer, to calculate the average data for one measurement task, and not averaged from long time measurement values.

Therefore, it is not recommendable to use the data in 'Emission Concentration' table for evaluating the pollution level of each emission source by compairing with 'Emission Standard' value.

[H-R-1] HOB measurement result

			2011-1	2011-2	2011-3	2011-4	2011-5
Measurement Date			16-Nov-11	25-Nov-11	29-Nov-11	2-Dec-11	9-Dec-11
General information	Place		NO.41 school	Ikhzasag university-1	NO.114 school	Haan Bank	Tavan gan
	Type of boiler		MUHT	DZL-0.7	WWGS-0.35	CLHG-0.6/C	CLSG25
	Capacity	MW	0.7	0.70	0.35	0.60	0.25
	Cross sectional area of duct	m2	0.062	0.075	0.085	0.062	0.049
	Type of coal		Nalaikh	Nalaikh	Nalaikh	Nalaikh	Nalaikh
Operational condition	Velocity of flue gas	m/s	- - - -	6.4 5.8 7.3	7.7 7.4 7.2	3.0 2.9 3.6	11.6 13.8 11.5
	Temperature of flue gas	℃	- - - -	87 84 83	101 94 80	219 173 234	341 502 360
	Water vapor concentration	%		4.3	1.1	2.2	7.7
	Flow rate of wet flue gas	Nm3/h		1124 1015 1286	1528 1497 1507	318 331 362	795 752 760
	Flow rate of wet flue gas	Nm3/h		1100 1000 1300	1500 1500 1500	320 330 360	800 750 760
	Flow rate of dry flue gas	Nm3/h		1076 972 1231	1511 1480 1490	311 324 354	734 694 701
	Flow rate of dry flue gas	Nm3/h		1100 1000 1200	1500 1500 1500	310 320 350	730 690 700
	Ave. flow rate of dry flue gas	Nm3/h		1100	1500	320	710
	Coal feed rate	kg/h	92	96	70	7.0	121
	O2 concentration	%	15.7	16.5	18.3	12.4	15.9
	CO2 concentoration	%	4.3	4.4	2.3	7.2	3.7
	CO concentoration	ppm	2925	310	890	4790	1740
Measured concentration (Raw data)	Dust concentration	g/Nm3	- - - -	0.18 0.12 0.27	0.16 0.05 0.11	0.042 0.29 0.20	3.4 4.3 8.2
	Average dust concentration	g/Nm3	#DIV/0!	0.19	0.10	0.18	5.3
	SO2 (ppm)	ppm	152	146	72	123	184
	NOx (ppm)	ppm	34	44	34	78	39

Emission Factor	Dust	kg/t	-	2.2	2.2	8.0	31
	SO2	kg/t	-	4.8	4.4	16	3.1
	NOx *	kg/t	-	0.67	1.0	4.8	0.31
	CO	kg/t	-	4.4	24	275	13
Dust sampling method							

* NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3		***0.50***	***0.45***	0.24	***12***
	SO2	ppm	227	***379***	***900***	158	***389***
	NOx	ppm	52	114	134	104	74
	CO	ppm	***8828***	793	***4764***	***6027***	***2924***
Emission Standard Value (MNS)	Dust	g/Nm3	0.4	0.4	0.4	0.4	0.4
	SO2	ppm	280	280	280	280	280
	NOx	ppm	336	336	336	336	336
	CO	ppm	2,000	2,000	2,000	2000	2000

[H-R-1] HOB measurement result

			2011-6	2011-7	2011-8	2011-9	2011-10
Measurement Date			14-Dec-11	16-Dec-11	20-Dec-11	22-Dec-11	4-Jan-12
General information	Place		MCS Tiger beer	Ikhzasag university-3	NO.60 secondary school	kyoyulaakhuu	NO.113 secondary school
	Type of boiler		DZL4	Unknown	MUHT	HP-18-54	MDZ-0.25
	Capacity	MW	4.0	Unknown	0.70	0.40	0.25
	Cross sectional area of duct	m2	0.12	0.20	0.075	0.79	0.091
	Type of coal		Nalaikh	Nalaikh	Nalaikh	Nalaikh+excrement	Nalaikh
Operational condition	Velocity of flue gas	m/s	29.4 / 29.2 / 31.3	10.6 / 9.9	26.7 / 24.1	1.8 / 1.1 / 1.4	3.1 / 5.5 / 3.3
	Temperature of flue gas	℃	134 / 149 / 131	67 / 83	145 / 178	135 / 130 / 142	167 / 163 / 185
	Water vapor concentration	%	4.9	3.3	5.3	0.56	4.3
	Flow rate of wet flue gas	Nm3/h	8354 / 7999 / 8972	5337 / 4790	4019 / 3366	2996 / 1870 / 2229	537 / 973 / 561
	Flow rate of wet flue gas	Nm3/h	8400 / 8000 / 9000	5300 / 4800	4000 / 3400	3000 / 1900 / 2200	540 / 970 / 560
	Flow rate of dry flue gas	Nm3/h	7946 / 7609 / 8534	5161 / 4632	3804 / 3186	2979 / 1860 / 2217	501 / 937 / 547
	Flow rate of dry flue gas	Nm3/h	7900 / 7600 / 8500	5200 / 4600	3800 / 3200	3000 / 1900 / 2200	500 / 940 / 550
	Ave. flow rate of dry flue gas	Nm3/h	8000	4800	3500	2300	580
	Coal feed rate	kg/h	2026	155	131	298	50
	O2 concentration	%	16.4	17.6	16.7	17.2	13.4
	CO2 concentoration	%	3.9	3.1	3.7	3.4	6.5
	CO concentoration	ppm	630	890	920	812	1487
Measured concentration (Raw data)	Dust concentration	g/Nm3	0.16 / 0.23 / 0.11	0.12 / 0.044	0.62 / 1.1	0.76 / 0.38 / 0.57	0.12 / 0.14 / 0.060
	Average dust concentration	g/Nm3	0.16	0.075	0.82	0.60	0.11
	SO2 (ppm)	ppm	112	134	116	97	245
	NOx (ppm)	ppm	45	40	52	46	56

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Emission Factor	Dust	kg/t	0.65	2.3	22	4.6	1.3
	SO2	kg/t	1.3	12	8.9	2.1	8.1
	NOx *	kg/t	0.24	1.6	1.9	0.48	0.86
	CO	kg/t	3.1	35	31	7.8	22
Dust sampling method							

* NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	0.53	0.26	***2.2***	***1.8***	0.18
	SO2	ppm	345	***465***	***318***	***281***	***398***
	NOx	ppm	138	131	129	141	88
	CO	ppm	***2145***	***3640***	***3683***	***3588***	***3715***
Emission Standard Value (MNS)	Dust	g/Nm3	12.0	0.3	0.4	0.4	0.4
	SO2	ppm	567	210	280	280	280
	NOx	ppm	859	299	336	336	336
	CO	ppm	824	1600	2000	2000	2000

[H-R-1] HOB measurement result

			2011-11				2011-12				2011-13				2011-14				2011-15			
Measurement Date			5-Jan-12				6-Jan-12				10-Jan-12				11-Jan-12				12-Jan-12			
General information	Place		NO.92 school				Train Repeair				NO.106 School				No.88 school				No.46school			
	Type of boiler		MDZ-063				BZUI 100				Thermochlor-0.3				KBPO7KB				CLSG			
	Capacity	MW	0.63				0.85				0.35				0.70				0.60			
	Cross sectional area of duct	m2	0.23				0.636				0.085				0.49				0.028			
	Type of coal		Nalaikh				Siveovoo				Nalaikh				Nalaikh				Nalaikh			
Operational condition	Velocity of flue gas	m/s	8.9	8.7	7.3		13.7	14.5	14.7		8.3	6.2	6.2		3.8	3.4	2.7		12.5	10.2		
	Temperature of flue gas	℃	101	97	107		225	243	217		77	117	96		90	93	92		244	167		
	Water vapor concentration	%	5.7				3.5				2.4				2.8				4.3			
	Flow rate of wet flue gas	Nm3/h	4750	4677	3850		17037	17391	18574		1737	1044	1216		4261	3786	3023		585	560		
	Flow rate of wet flue gas	Nm3/h	4800	4700	3900		17000	17000	19000		1700	1000	1200		4300	3800	3000		590	560		
	Flow rate of dry flue gas	Nm3/h	4477	4409	3629		16441	16782	17924		1696	1019	1187		4143	3682	2940		560	536		
	Flow rate of dry flue gas	Nm3/h	4500	4400	3600		16000	17000	18000		1700	1000	1200		4100	3700	2900		560	540		
	Ave. flow rate of dry flue gas	Nm3/h	4200				17200				1200				3600				570			
	Coal feed rate	kg/h	150				1334				126				125				46			
	O2 concentration	%	17.3				16.3				17.9				18.5				15.3			
	CO2 concentoration	%	3.1				4.1				2.6				2.0				4.6			
	CO concentoration	ppm	490				1990				650				729				3760			
Measured concentration (Raw data)	Dust concentration	g/Nm3	0.52	0.72	0.64		0.75	0.92	0.81		0.17	0.79	0.82		0.89	1.4	1.1		0.13	0.27		
	Average dust concentration	g/Nm3	0.63				0.83				0.62				1.1				0.20			
	SO2 (ppm)	ppm	58				102				87				76				182			
	NOx (ppm)	ppm	26				62				33				17				36			

Emission Factor	Dust	kg/t	18	11	5.9	32	2.5
	SO2	kg/t	4.6	3.8	2.4	6.3	6.4
	NOx *	kg/t	1.0	1.1	0.43	0.68	0.59
	CO	kg/t	17	32	7.7	26	58
Dust sampling method							

* NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	***2.0***	***2.0***	***2.3***	***5.2***	***0.41***
	SO2	ppm	182	***266***	***332***	***359***	***361***
	NOx	ppm	82	151	128	80	72
	CO	ppm	1896	***2178***	***4648***	***3065***	***6549***
Emission Standard Value (MNS)	Dust	g/Nm3	0.4	0.3	0.4	0.4	0.4
	SO2	ppm	280	210	280	280	280
	NOx	ppm	336	299	336	336	336
	CO	ppm	2000	1600	2000	2000	2000

[H-R-1] HOB measurement result

			2011-16				2011-17				2011-18				2011-19				2011-19			
Measurement Date			15-Jan-12				17-Jan-12				19-Jan-12				20-Jan-12				22-Jan-12			
General information	Place		No.10 school				BELON LLC				No.17 Secondary School				No.58 Secondary School				No.59 School			
	Type of boiler		MWB-1				HP18-27				Viaduras VSB IV				MUHT 1.2				Mon dulaan			
	Capacity	MW	1.0				0.2				0.385				0.70				0.063			
	Cross sectional area of duct	m2	0.50				0.042				0.13				0.196				0.013			
	Type of coal		Nalaikh (crushed)				Nalaikh				Baganuur				Nalaikh				Nalaikh (lump)			
Operational condition	Velocity of flue gas	m/s	6.0	6.1	6.4		10.9	11.5	11.2		3.8	3.4	4.0		6.4	4.8	4.7		5.4	6.5		
	Temperature of flue gas	℃	168	168	171		298	316	299		127	80	122		135	101	108		235	232		
	Water vapor concentration	%	7.2				9.0				2.9				0.49				4.7			
	Flow rate of wet flue gas	Nm3/h	5826	5956	6175		673	684	689		1026	1069	1128		2527	2152	2084		143	143		
	Flow rate of wet flue gas	Nm3/h	5800	6000	6200		670	680	690		1000	1100	1100		2500	2200	2100		140	140		
	Flow rate of dry flue gas	Nm3/h	5421	5518	5733		612	622	627		997	1038	1096		2515	2141	2074		136	136		
	Flow rate of dry flue gas	Nm3/h	5400	5500	5700		610	620	630		1000	1000	1100		2500	2100	2100		140	140		
	Ave. flow rate of dry flue gas	Nm3/h	5600				620				1000				2300				140			
	Coal feed rate	kg/h	714				109				41				266				4.1			
	O2 concentration	%	16.0				12.9				17.6				14.5				15.3			
	CO2 concentoration	%	3.9				6.4				3.1				5.9				5.0			
	CO concentoration	ppm	10900				4190				6993				6413				1990			
Measured concentration (Raw data)	Dust concentration	g/Nm3	2.0	3.1	1.9		1.0	1.3	0.80		0.027	0.86	0.82		3.9				0.0094	0.15		
	Average dust concentration	g/Nm3	2.3				1.0				0.17				3.9				0.10			
	SO2 (ppm)	ppm	254				65				100				197				150			
	NOx (ppm)	ppm	38				47				30				45				65			

Emission Factor	Dust	kg/t	18	5.8	4.1	34	3.5
	SO2	kg/t	5.7	1.1	6.9	4.9	15
	NOx *	kg/t	0.40	0.36	1.0	0.52	3.0
	CO	kg/t	107	30	212	69	86
Dust sampling method							

* NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	*5.4*	*1.5*	*0.68*	*7.0*	0.16
	SO2	ppm	*698*	*280*	*360*	*922*	*309*
	NOx	ppm	89	183	96	70	132
	CO	ppm	*23987*	*6035*	*28235*	*11870*	*4121*
Emission Standard Value (MNS)	Dust	g/Nm3	0.3	0.4	0.4	0.4	0.4
	SO2	ppm	210	280	280	280	280
	NOx	ppm	299	336	336	336	336
	CO	ppm	1600	2000	2000	2000	2000

[H-R-1] HOB measurement result

			2011-20				2011-21				2011-22				2011-23				2011-24			
Measurement Date			31-Jan-12				1-Feb-12				3-Feb-12				9-Feb-12				10-Feb-12			
General information	Place		Police Academy				No. 71 School				No. 104 School				Ecology Institute				No. 118 School			
	Type of boiler		DZL 2.8				Dliirsh 170-88/55				WWGS 0.35				unknown				Carborobot 300			
	Capacity	MW	2.8				0.17				0.35				unknown				0.30			
	Cross sectional area of duct	m2	0.181				0.152				0.068				0.138				0.025			
	Type of coal		Nalaikh				Buganuur				Nalaikh				Nalaikh				Nalaikh			
Operational condition	Velocity of flue gas	m/s	12.9	12.5	13.5		6.8	7.2			6.6	7.0	6.13		6.8	6.6	6.7		11.7	12.2	11.4	
	Temperature of flue gas	℃	164	171	175		220	221			188	197	182		225	195	214		98	98	105	
	Water vapor concentration	%	10.4				5.6				5.6				2.6				7.3			
	Flow rate of wet flue gas	Nm3/h	4529	4312	4620		1758	1874			820	853	771		1595	1658	1619		680	711	651	
	Flow rate of wet flue gas	Nm3/h	4500	4300	4600		1800	1900			820	850	770		1600	1700	1600		680	710	650	
	Flow rate of dry flue gas	Nm3/h	4059	3864	4140		1659	1768			774	806	729		1554	1616	1578		630	659	603	
	Flow rate of dry flue gas	Nm3/h	4100	3900	4100		1700	1800			770	810	730		1600	1600	1600		630	660	600	
	Ave. flow rate of dry flue gas	Nm3/h	4,000				1,700				770				1,600				630			
	Coal feed rate	kg/h	628				81				63				74				92			
	O2 concentration	%	10.9				14.0				12.3				17.9				15.0			
	CO2 concentoration	%	8.7				6.0				7.2				2.5				5.0			
	CO concentoration	ppm	84				1185				5921				2922				2776			
Measured concentration (Raw data)	Dust concentration	g/Nm3	0.18	0.32	0.27		0.36	0.59			0.17	0.19	0.028		0.67	0.073	0.066		0.58	0.64	0.35	
	Average dust concentration	g/Nm3	0.26				0.48				0.13				0.27				0.53			
	SO2 (ppm)	ppm	442				124				221				110				237			
	NOx (ppm)	ppm	126				84				40				23				68			

Emission Factor	Dust	kg/t	1.6	10	1.6	5.8	3.6
	SO2	kg/t	8.0	7.4	7.8	6.8	4.7
	NOx *	kg/t	1.1	2.4	0.66	0.66	0.63
	CO	kg/t	0.67	31	91	79	24
Dust sampling method							

* NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	0.30	***0.79***	0.18	***0.99***	***1.0***
	SO2	ppm	***510***	206	***289***	***398***	***462***
	NOx	ppm	144	139	54	82	132
	CO	ppm	97	***2118***	***6111***	***7416***	***5920***
Emission Standard Value (MNS)	Dust	g/Nm3	0.3	0.4	0.4	0.3	0.4
	SO2	ppm	210	280	280	210	280
	NOx	ppm	299	336	336	299	336
	CO	ppm	1600	2000	2000	1600	2000

[H-R-1] HOB measurement result

			2011-25				2011-26				2011-27			
Measurement Date			13-Feb-12				14-Feb-12				15-Feb-12			
General information	Place		No. 102 School				No. 63 School				No. 105 School			
	Type of boiler		HP18-27				BNEB				Viadurus			
	Capacity	MW	unknown				0.23				0.39			
	Cross sectional area of duct	m2	0.053				0.031				0.042			
	Type of coal		Nalaikh				Nalaikh				Baganuur			
Operational condition	Velocity of flue gas	m/s	11.6	11.7	10.3		3.7	3.7	4.0		13.7	12.8	11.7	
	Temperature of flue gas	℃	212	288	193		78	85	95		273	269	268	
	Water vapor concentration	%	7.0				3.5				7.8			
	Flow rate of wet flue gas	Nm3/h	1066	934	986		278	274	286		868	818	751	
	Flow rate of wet flue gas	Nm3/h	1100	930	990		280	270	290		870	820	750	
	Flow rate of dry flue gas	Nm3/h	991	869	917		268	265	276		801	754	693	
	Flow rate of dry flue gas	Nm3/h	990	870	920		270	260	280		800	750	690	
	Ave. flow rate of dry flue gas	Nm3/h	918				271				749			
	Coal feed rate	kg/h	60				17				112			
	O2 concentration	%	13.7				13.8				15.2			
	CO2 concentoration	%	6.2				6.3				4.8			
	CO concentoration	ppm	2183				743				973			
Measured concentration (Raw data)	Dust concentration	g/Nm3	1.35	1.23	0.30		0.37	0.072	0.076		0.23	0.15	0.14	
	Average dust concentration	g/Nm3	1.0				0.15				0.18			
	SO2 (ppm)	ppm	371				314				132			
	NOx (ppm)	ppm	38				80				47			

Emission Factor	Dust	kg/t	15	2.3	1.2
	SO2	kg/t	16	14	2.5
	NOx *	kg/t	0.78	1.7	0.4
	CO	kg/t	42	15	8.1
Dust sampling method					

* NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	***1.6***	0.24	0.35
	SO2	ppm	***606***	***491***	269
	NOx	ppm	62	125	93
	CO	ppm	***3769***	1798	1893
Emission Standard Value (MNS)	Dust	g/Nm3	0.3	0.4	0.4
	SO2	ppm	210	280	280
	NOx	ppm	299	336	336
	CO	ppm	1600	2000	2000

[P-R-1] Measurement results of NO.3 Power Plant

Measurement Date			6-Dec-11				7-Dec-11				24-Jan-12				24-Jan-12			
No. of boiler			NO.4(75t/h)				NO.6(75t/h)				NO.7(220t/h)				NO.10(220t/h)			
Cross sectional area of duct		m2	2.12		1.44		2.36		1.88		-		3.72		-		3.72	
Type of coal			Buganuur		Buganuur		Buganuur		Buganuur		Buganuur		Buganuur		Buganuur		Buganuur	
Measurement duct			before scrubber		after scrubber		before scrubber		after scrubber		before scrubber		after scrubber		before scrubber		after scrubber	
			left duct	right duct	left duct	right duct	left duct	right duct	left duct	right duct	left duct	right duct	left duct	right duct	left duct	right duct	left duct	right duct
Operational condition	Velocity of flue gas	m/s	10.1	10.9	10.9	11.3	28.2	28.3	24.8	25.0	-	-	8.1	8.7	-	-	10.1	11.8
	Temperature of flue gas	℃	131	116	68	53	168	163	68	74	-	-	82	80	-	-	64	64
	Water vapor concentration	%	8.5	8.7	12.3	10.7	5.5	11.2	3.9	3.9	-	-	5.5	16.5	-	-	3.9	9.0
	Flow rate of wet flue gas	Nm3/h	44,500	50,200	38,300	41,500	128,400	130,500	115,100	114,200	-	-	70,800	75,500	-	-	90,400	106,500
	Flow rate of dry flue gas	Nm3/h	40,800	45,900	33,600	37,100	121,400	116,000	110,600	109,800	-	-	67,000	63,000	-	-	86,900	96,900
	Total flow rate of dry flue gas	Nm3/h	86,700		70,700		237,400		220,400		-		130,000		-		183,800	
	Coal feed rate	kg/h	11,000				14,000				37,340				26,820			
	O2 concentration	%	8.6	8.9	8.8	9.0	5.7	4.8	4.4	5.2	-	-	14.0	14.6	-	-	16.3	16.3
	CO2 concentoration	%	11.1	10.8	10.9	10.7	13.4	14.3	14.8	13.9	-	-	6.4	5.8	-	-	4.4	4.4
	CO concentoration	ppm	177	130	152	129	21	31	33	26	-	-	77	27	-	-	2.4	2.4
Dust (Raw data)	Dust concentration	g/Nm3	8.75	9.19	0.28	0.09	5.99	6.23	0.75	0.58	-	-	1.55	1.39	-	-	0.40	0.47
	Average of Dust concentration	g/Nm3	9.0		0.19		6.11		0.67		-		1.47		-		0.43	
	Efficiency of de-dust	%	97.9				89.1				-				-			
Gas (Raw data)	NOx concentration	ppm	209	216	213	215	311	307	350	306	-	-	146	142	-	-	95	95
	SO2 concentration	ppm	316	275	208	225	237	272	145	182	-	-	173	156	-	-	54	54
	Measurement time		14:53-15:19	15:24-15:46	13:02-13:39	13:46-14:32	13:38-13:54	13:02-13:23	11:32-12:07	12:12-12:48	-	-	12:10-13:51	15:02-16:10	-	-	16:50-17:50	18:24-19:47

Emission Factor	Dust factor for each duct	kg/t	-		0.86	0.30	-		5.9	4.5	-		2.8	2.3	-		1.3	1.7
	Dust factor as a boiler	kg/t			1.2				10		-		5.1		-		3.0	
	SO2	kg/t	-		4.0		-		7.4		-		1.6		-		1.1	
	NOx	kg/t	-		1.8		-		6.9		-		0.67		-		0.88	
	CO	kg/t			1.1				0.6		-		0.2		-		0.021	
Emission Concentration after O2 conversion at 6%	Dust	g/Nm3	0.23				0.61				3.3				1.4			
	SO2	ppm	268				152				371				173			
	NOx	ppm	265				303				324				307			
	CO	ppm	174				27				115				7.8			
Emission Standard Value (MNS)	Dust	g/Nm3	1.2				21				10.8				10.8			
	SO2	ppm	215.3				676.1				519.8				519.8			
	NOx	ppm	238.9				948.3				821.3				821.3			
	CO	ppm	4996				2838				240				240			
Remarks			Fluidized bed furnace															

* Molecular weight of NO is used for converting the NOx unit from ppm to mg/m3

[H-R-1] GER measurement result

Measurement Date			28-Dec-11				29-Dec-11						30-Dec-11			
General information	Place		Obi's ger				Obi's ger						Obi's ger			
	Type of boiler		traditional ger stove				traditional ger stove						turky ger stove			
	Capacity	MW	-				-						-			
	Cross sectional area of duct	m2	0.0095				0.0095						0.0133			
	Type of coal		wood only				wood+Nalaikh coal						wood only			
Operational condition	Velocity of flue gas	m/s	2.9	4.4	3.0		2.7	2.8	3.6	2.5	3.0	2.3	2.1	4.4	3.0	
	Temperature of flue gas	℃	191	271	85		176	195	299	221	207	120	168	350	116	
	Water vapor concentration	%	4.7				5.3						5.9			
	Flow rate of wet flue gas	Nm3/h	50	64	65		39	46	49	40	50	47	53	79	86	
	Flow rate of dry flue gas	Nm3/h	47	58	64		37	42	44	38	50	47	51	71	85	
	Ave. flow rate of dry flue gas	Nm3/h	58				45						75			
	Fuel feed rate	kg/h	2.5 （Wood）				1.7 （Coal）						1.2 （Wood）			
	O2 concentration	%	20.1				17.2						19.0			
	CO2 concentoration	%	1.0				3.1						1.7			
	CO concentoration	ppm	740				1782						1340			
Measured concentration (Raw data)	Dust concentration	g/Nm3	0.23	0.18	0.037		0.00055	0.81	0.035	0.043	0.14	0.000	0.000	0.323	0.000	
	Average dust concentration	g/Nm3	0.11				0.17						0.17			
	SO2（ppm）	ppm	0.2				17						6.1			
	NOx（ppm）	ppm	1.2				30						6.4			

Emission Factor	Dust	kg/t	2.6	4.4	11
	SO2	kg/t	0.012	1.2	1.1
	NOx *	kg/t	0.039	1.1	0.55
	CO	kg/t	21.5	58	107
Dust sampling method					

* NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	1.3	0.53	0.98
	SO2	ppm	1.8	55	22
	NOx	ppm	10	87	24
	CO	ppm	6732	6688	4997
Emission Standard Value (MNS)	Dust	g/Nm3	2.5	2.5	2.5
	SO2	ppm	-	-	-
	NOx	ppm	-	-	-
	CO	ppm	3200	3200	3200

[H-R-1] GER measurement result

Measurement Date		31-Dec-11					5-Feb-12					6-Feb-12				
General information	Place	Obi's ger					Mr. Davaajargal Home					Mr. Davaajargal Ger				
	Type of boiler	turky ger stove					Wall stove					Ger stove (Coal)				
	Capacity	-					-					-				
	Cross sectional area of duct	0.0133					0.0532					0.0079				
	Type of coal	wood+Nalaikh coal					Nalaikh					Nalaikh				
Operational condition	Velocity of flue gas	2.4	2.6	2.6	0.5		0.21	0.6	0.3			4.5	5.7	3.1		
	Temperature of flue gas	213	145	130	76		94	101	106			276	469	252		
	Water vapor concentration	5.0					1.4					7.8				
	Flow rate of wet flue gas	54	68	70	16		26	70	35			55	51	39		
	Flow rate of dry flue gas	54	68	70	16		25	69	35			51	47	36		
	Ave. flow rate of dry flue gas	56					38					45				
	Fuel feed rate	2.2 （Coal）					2.0 （Coal）					2.3 （Coal）				
	O2 concentration	17.1					18.9					14.0				
	CO2 concentoration	3.1					1.8					5.9				
	CO concentoration	1427					2490					3014				
Measured concentration (Raw data)	Dust concentration	0.29	0.13	0.11	0.00		0.42	0.57	0.49			0.54	0.064	0.0028		
	Average dust concentration	0.13					0.50					0.23				
	SO2（ppm）	45					109					131				
	NOx（ppm）	27					23					29				

Emission Factor	Dust	3.3	9.8	4.4
	SO2	3.3	6.1	7.3
	NOx *	0.94	0.61	0.76
	CO	46	60.4	73.4
Dust sampling method		Constant flow rate sampling	Constant flow rate sampling	

* NO molecular weight is used for convert the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	0.38	2.8	0.38
	SO2	154	630	204
	NOx	64	131	40
	CO	5606	14048	7193
Emission Standard Value (MNS)	Dust	2.5	2.5	2.5
	SO2	-	-	-
	NOx	-	-	-
	CO	3200	3200	3200

[H-R-1] GER measurement result

Measurement Date		6-Feb-12			
General information	Place	Mr. Davaajargal Ger			
	Type of boiler	Ger stove (Semi-Coke)			
	Capacity	-			
	Cross sectional area of duct	0.0079			
	Type of coal	Nalaikh			
Operational condition	Velocity of flue gas	4.0	2.8	3.3	
	Temperature of flue gas	246	237	158	
	Water vapor concentration	1.9			
	Flow rate of wet flue gas	51	36	51	
	Flow rate of dry flue gas	50	35	50	
	Ave. flow rate of dry flue gas	45			
	Fuel feed rate	1.0 （Semi-Coke）			
	O2 concentration	18.6			
	CO2 concentoration	2.1			
	CO concentoration	4430			
Measured concentration (Raw data)	Dust concentration	0.035	0.013	0.0044	
	Average dust concentration	0.018			
	SO2（ppm）	22			
	NOx（ppm）	5.3			

Emission Factor	Dust	0.79
	SO2	2.7
	NOx *	0.31
	CO	244
Dust sampling method		Constant flow rate sampling

* NO molecular weight is used for convert the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	0.088
	SO2	110
	NOx	25
	CO	18932
Emission Standard Value (MNS)	Dust	2.5
	SO2	-
	NOx	-
	CO	3200

[H-R-1] HOB measurement result

Measurement Date			15-Jan-13				16-Jan-13				31-Jan-13					
General information	Place		#76 School				#20 Kindergarten				#104 school					
	Type of boiler		DZL-1.4				DZL-0.7				SHG 0.7					
	Capacity	MW	1.4				0.70				0.35					
	Cross sectional area of duct	m2	0.11				0.16				0.032					
	Type of coal		Nalaikh				Nalaikh				Nalaikh					
Operational condition	Velocity of flue gas	m/s	13.8	11.6	13.0		0.9	0.8	2.0		22.2	21.6	20.3	9.0		
	Temperature of flue gas	℃	119	117	118		58	53	56		129	132	146	100		
	Water vapor concentration	%	13.9				7.8				8.4					
	Flow rate of wet flue gas	Nm3/h	3062	2588	2898		393	392	836		1561	1508	1369	681		
	Flow rate of wet flue gas	Nm3/h	3060	2590	2900		390	390	840		1560	1510	1370	680		
	Flow rate of dry flue gas	Nm3/h	2637	2229	2496		362	361	770		1457	1407	1278	636		
	Flow rate of dry flue gas	Nm3/h	2640	2230	2500		360	360	770		1460	1410	1280	640		
	Ave. flow rate of dry flue gas	Nm3/h	2,454				498				1,194					
	Coal feed rate	kg/h	275				186				64					
	O2 concentration	%	10.6				12.6				16.3					
	CO2 concentoration	%	9.5				7.9				4.5					
	CO concentoration	ppm	50				711				196					
Measured concentration (Raw data)	Dust concentration	g/Nm3	0.55	0.52	0.62		0.030	0.014	0.0028		0.031	0.045	0.044	0.12		
	Average dust concentration	g/Nm3	0.56				0.012				0.050					
	SO2 (ppm)	ppm	625				81				274					
	NOx (ppm)	ppm	155				87				47					

Галлагааны үед салхилуурын шифрийг тохируулсан

Өндөр үзүүлэлттэй гарсан

Emission Factor	Dust	kg/t	5.0	0.032	0.93
	SO2	kg/t	16	0.62	14.6
	NOx *	kg/t	1.9	0.31	1.2
	CO	kg/t	0.56	2.4	4.6
Dust sampling method			Isokinetic sampling	Isokinetic sampling	Isokinetic sampling

* NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	***0.63***	0.016	0.12
	SO2	ppm	***700***	107	***684***
	NOx	ppm	172	115	111
	CO	ppm	60	1237	669
Emission Standard Value (MNS)	Dust	g/Nm3	0.3	0.4	0.4
	SO2	ppm	210	280	280
	NOx	ppm	299	336	336
	CO	ppm	1600	2000	2000

[H-R-1] GER measurement result

Measurement Date			9-Oct-12				9-Oct-12				25-Oct-12				25-Oct-12				
General information	Place		Daba's ger				Daba's ger				Daba's ger				Daba's ger				
	Type of boiler		traditional ger stove				traditional ger stove				traditional ger stove				traditional ger stove				
	Capacity	MW	-				-				-				-				
	Cross sectional area of duct	m2	0.0079				0.0079				0.0079				0.0079				
	Type of coal		wood briquet				semicoke				wood briquet B				semicoke briquet				
Operational condition	Velocity of flue gas	m/s	5.0	5.1	4.0		4.5	4.8			3.6	2.0			2.8	2.0			
	Temperature of flue gas	℃	431	477	313		402	435			389	207			257	146			
	Water vapor concentration	%	13.9				17.6				10.4				3.5				
	Flow rate of wet flue gas	Nm3/h	47	44	44		44	44			47	61			77	68			
	Flow rate of dry flue gas	Nm3/h	40	38	38		36	36			42	55			74	66			
	Ave. flow rate of dry flue gas	Nm3/h	39				36				48				70				
	Fuel feed rate	kg/h	3.1 （Wood B.）				2.1 （Semi-Coke）				2.8 （Wood B.）				2.4 （Semi-Coke）				
	O2 concentration	%	13.9				14.8				16.5				18.5				
	CO2 concentoration	%	6.5				5.8				4.2				2.5				
	CO concentoration	ppm	12533				2877				4319				1508				
Measured concentration (Raw data)	Dust concentration	g/Nm3	0.96	0.04	0.02		0.61	0.02			0.38	0.01			0.15	0.03			
	Average dust concentration	g/Nm3	0.35				0.32				0.17				0.09				
	SO2（ppm）	ppm	226				67				66				46				
	NOx（ppm）	ppm	24				46				23				14				

Emission Factor	Dust	kg/t	4.4	5.4	3.0	2.7
	SO2	kg/t	8.1	3.3	3.3	3.9
	NOx *	kg/t	0.40	1.05	0.55	0.56
	CO	kg/t	195	62	94	56
Dust sampling method						

* NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	0.58	0.59	0.45	0.43
	SO2	ppm	252	125	115	280
	NOx	ppm	42	78	70	57
	CO	ppm	14938	10516	7646	8757
Emission Standard Value (MNS)	Dust	g/Nm3	2.5	2.5	2.5	2.5
	SO2	ppm	-	-	-	-
	NOx	ppm	-	-	-	-
	CO	ppm	3200	3200	3200	3200

[H-R-1] GER measurement result

Measurement Date		23-Jan-13				24-Jan-13				25-Jan-13				24-Jan-13				28-Jan-13			
General information	Place	Otgonbayal's ger				Otgonbayal's ger				Otgonbayal's ger				Otgonbayal's ger				Otgonbayal's ger			
	Type of boiler	traditional ger stove				t raditional ger stove				tradional				traditional ger stove				traditional ger stove			
	Capacity	-				-				-				-				-			
	Cross sectional area of duct	0.0079				0.0079				0.0079				0.0079				0.0079			
	Type of coal	Wood briquet (Tunkhel)				Wood briquet (Hyalgant)				wood briquet (2-step loan)				semicoke (PP2)				semi coke briquet(MAK)			
Operational condition	Velocity of flue gas	3.0	3.0	3.0		2.5	2.5	3.0		4.0	3.5			3.5	3.0	2.8		2.2	2.3	2.1	2.5
	Temperature of flue gas	200	200	200		207	230	387		443	340			239	266	235		128	140	134	149
	Water vapor concentration	6.1				9.6				5.4				2.4				4.2			
	Flow rate of wet flue gas	42	42	42		34	33	28		37	36			45	36	36		36	35	33	38
	Flow rate of dry flue gas	36	40	41		32	31	26		35	34			44	35	35		34	34	32	36
	Ave. flow rate of dry flue gas	39				30				34				38				35			
	Fuel feed rate	2.0 (Wood B.)				2.8 (Wood B.)				2.0 (Wood B.)				1.0 (Semi-Coke)				1.0 (Semi-Coke)			
	O2 concentration	17.9				15.7				17.5				18.1				18.7			
	CO2 concentoration	2.9				4.4				2.8				2.2				2.1			
	CO concentoration	2435				2425				1513				3244				2350			
Measured concentration (Raw data)	Dust concentration	0.35	0.11	0.29		0.10	0.082	0.10		0.072	0.051			0.0053	0.0013	0.0017		0.071	0.072	0.070	0.0093
	Average dust concentration	0.21				0.095				0.056				0.0029				0.029			
	SO2 (ppm)	21				14				7.2				1.5				16			
	NOx (ppm)	16				25				13				9.4				12			

Emission Factor	Dust	4.1	1.0	0.97	0.11	1.0
	SO2	1.2	0.42	0.36	0.16	1.6
	NOx *	0.43	0.35	0.31	0.47	0.59
	CO	60	32	33	152	104
Dust sampling method		Constant flow rate sampling	Isokinetic sampling	Isokinetic sampling	Isokinetic sampling	Isokinetic sampling

* NO molecular weight is used for conve

Emission Concentration after O2 conversion at 9.33%	Dust	0.78	0.21	0.19	0.011	0.15
	SO2	71	22	29	5.1	83
	NOx	63	54	46	35	64
	CO	9191	5930	5966	15203	12161
Emission Standard Value (MNS)	Dust	2.5	2.5	2.5	2.5	2.5
	SO2	-	-	-	-	-
	NOx	-	-	-	-	-
	CO	3200	3200	3200	3200	3200

[H-R-1] GER measurement result

Шаталт тогтуун явагдах үед　　Эрчимт галлагааны үед

Measurement Date			21-Jan-13				22-Jan-13					28-Jan-13				29-Jan-13			
General information	Place		Otgonbayal's ger				Otgonbayal's ger					Otgonbayal's ger				Otgonbayal's ger			
	Type of boiler		turky ger stove coal1				turky ger stove coal2					traditional ger stove				traditional ger stove			
	Capacity	MW	-				-					-				-			
	Cross sectional area of duct	m2	0.013				0.013					0.0079				0.0079			
	Type of coal		Nalaikh				Nalaikh					Nalaikh				Nalaikh			
Operational condition	Velocity of flue gas	m/s	0.7～1.4	0.7～1.4	0.7～1.4		1 ～ 2	1 ～ 2	1 ～ 2	1 ～ 2	1 ～ 2	3.3	3.7	2.5		2.5	2.6	1.9	
	Temperature of flue gas	℃	255	348	255		513	525	469	373	312	205	227	197		161	213	134	
	Water vapor concentration	%	13.3				10.9					3.0				2.9			
	Flow rate of wet flue gas	Nm3/h	15	13	15		14	14	15	17	19	44	48	34		37	35	30	
	Flow rate of dry flue gas	Nm3/h	13	11	13		13	13	13	15	17	43	47	33		36	34	29	
	Ave. flow rate of dry flue gas	Nm3/h	13				14					36				30			
	Fuel feed rate	kg/h	1.8				1.8					1.6				1.6			
	O2 concentration	%	15.0				14.7					17.3				16.3			
	CO2 concentoration	%	4.8				5.4					3.2				3.9			
	CO concentoration	ppm	1060				285					2230				4292			
Measured concentration (Raw data)	Dust concentration	g/Nm3	0.018	0.021	0.0042		0.034	0.016	0.022	0.032	0.040	0.14	0.024	0.042		0.099	0.21	0.022	
	Average dust concentration	g/Nm3	0.0062				0.029					0.055				0.061			
	SO2 (ppm)	ppm	131				117					36				71			
	NOx (ppm)	ppm	69				57					41				45			

Emission Factor	Dust	kg/t	0.043 ～ 0.085	0.23 ～ 0.45	1.2	1.2
	SO2	kg/t	2.6 ～ 5.2	2.6 ～ 5.2	2.3	3.9
	NOx *	kg/t	0.63 ～ 1.3	0.59 ～ 1.2	1.2	1.2
	CO	kg/t	9.1 ～ 18	2.8 ～ 5.6	63	103
Dust sampling method			Constant flow rate sampling	Constant flow rate sampling	Isokinetic sampling	Isokinetic sampling

* NO molecular weight is used for converting the NOx unit from ppm to mg/m3

Emission Concentration after O2 conversion at 9.33%	Dust	g/Nm3	0.012	0.054	0.17	0.15
	SO2	ppm	254	207	104	186
	NOx	ppm	137	98	125	110
	CO	ppm	1962	565	7298	11491
Emission Standard Value (MNS)	Dust	g/Nm3	2.5	2.5	2.5	2.5
	SO2	ppm	-	-	-	-
	NOx	ppm	-	-	-	-
	CO	ppm	3200	3200	3200	3200

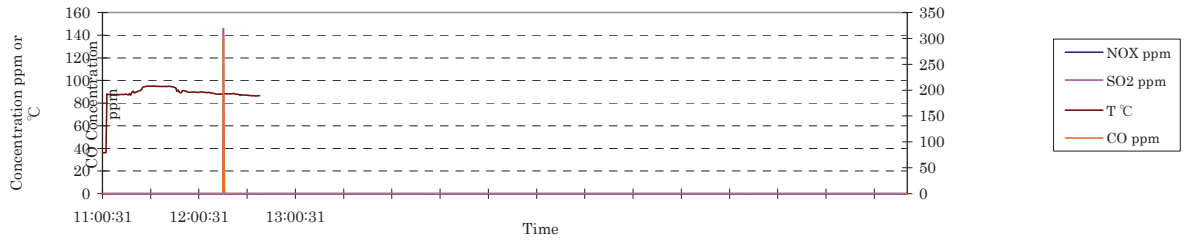
Graph of Measurement Result

Date:	2011/11/25
Place:	Ikhzasag university-1
HOB type:	DZL-0.7
Boiler Capacity (kW):	0.70
Cross sectional area of duct (m2):	0.075
Type of Coal:	Nalaikh

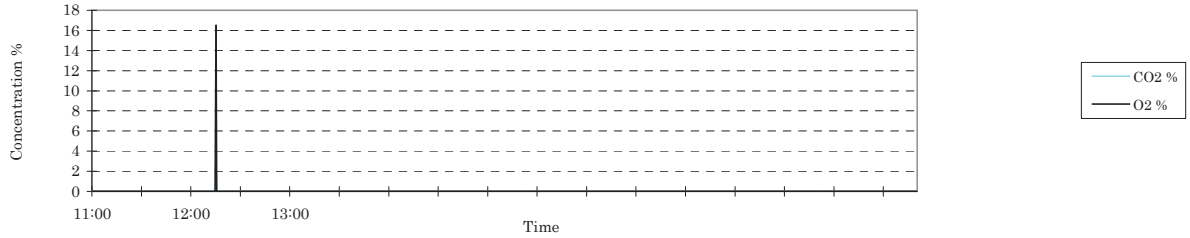
Comment:

HODAKA did't work in the first half of the measurement.

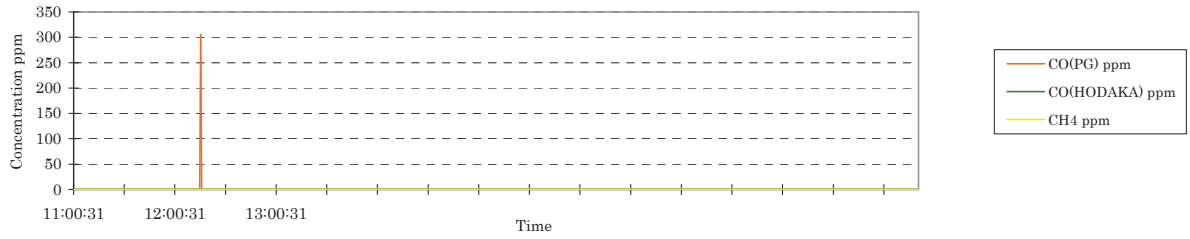
NOX,SO2,CO(Horiba),T



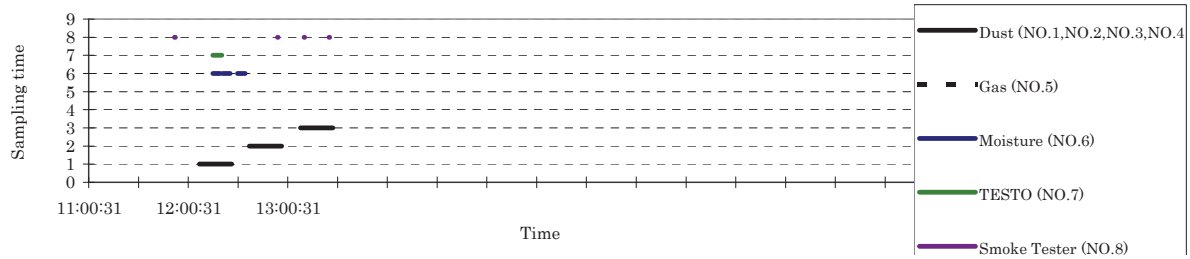
CO2,O2



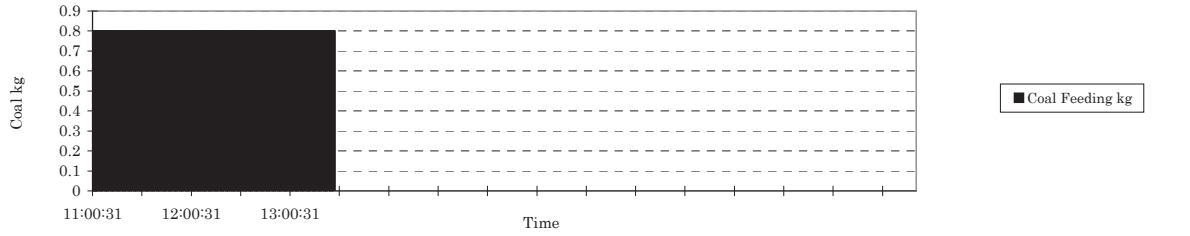
CO(PG-250),CO(HODAKA)



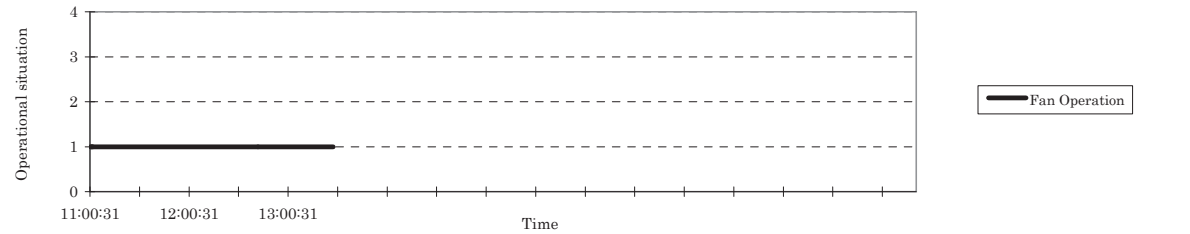
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

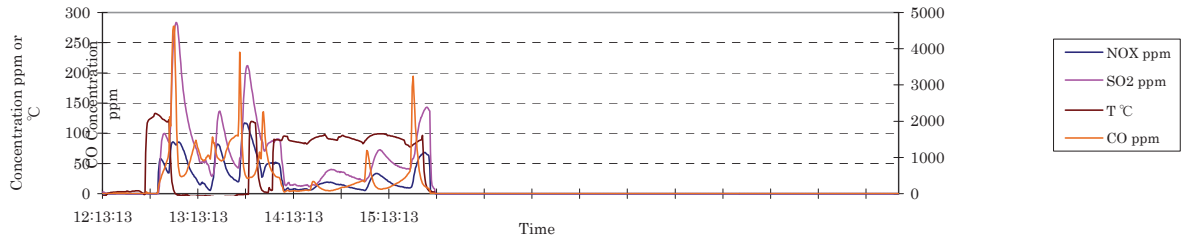
Graph of Measurement Result

Date:	2011/11/29
Place:	NO.114 school
HOB type:	WWGS-0.35
Boiler Capacity (kW):	0.35
Cross sectional area of duct (m2):	0.085
Type of Coal:	Nalaikh

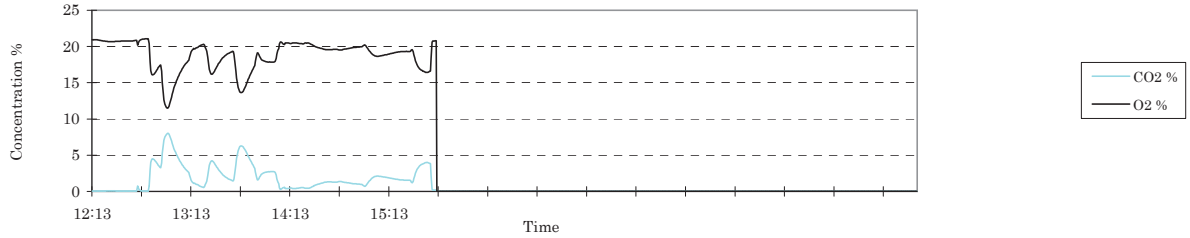
Comment:

HODAKA did't work in the first half of the measurement.

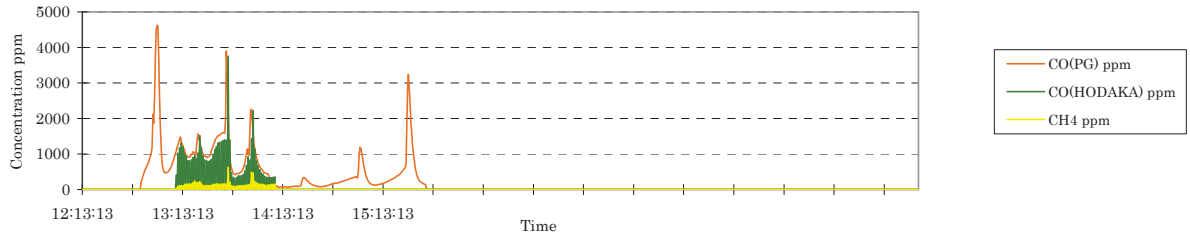
NOX,SO2,CO(Horiba),T



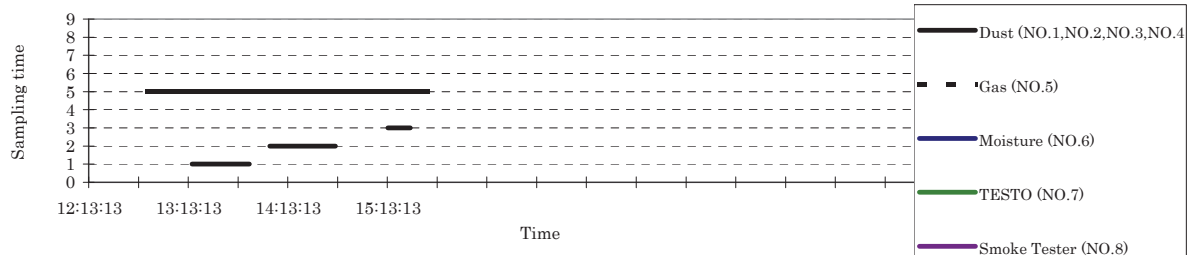
CO2,O2



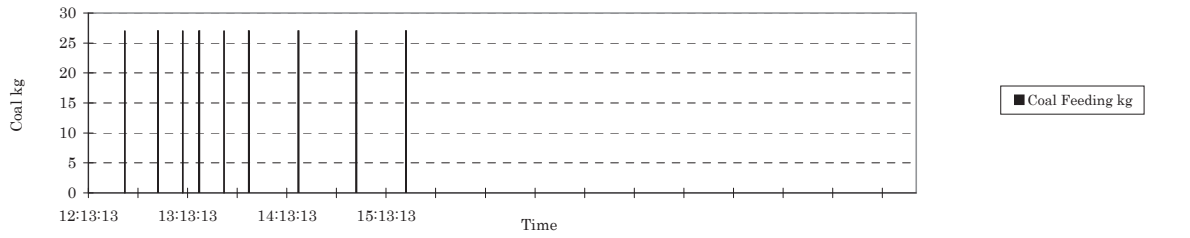
CO(PG-250),CO(HODAKA)



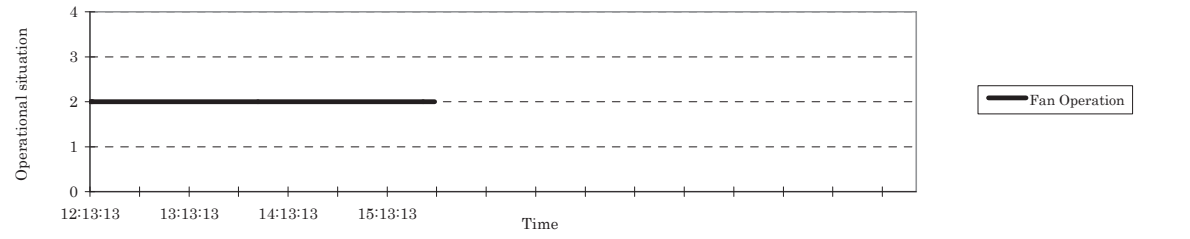
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



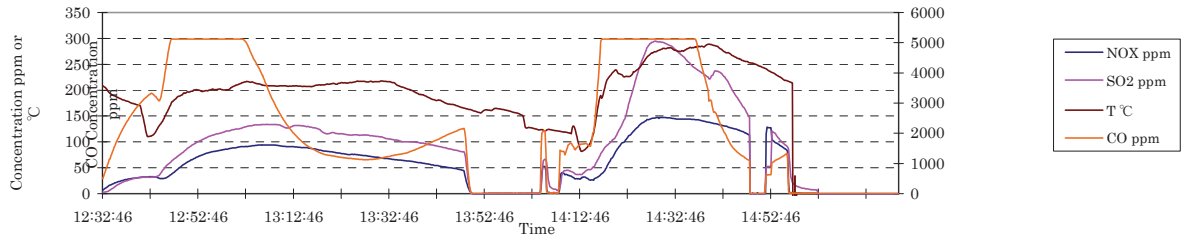
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

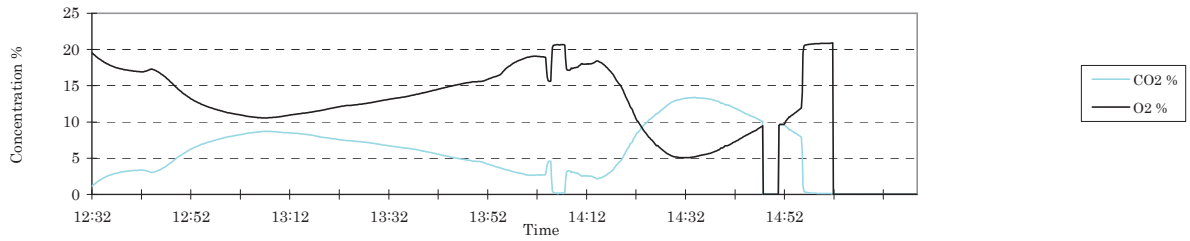
Date:	2011/12/2
Place:	Haan Bank
HOB type:	CLHG-0.6/C
Boiler Capacity (kW):	0.60
Cross sectional area of duct (m2):	0.062
Type of Coal:	Nalaikh

Comment:

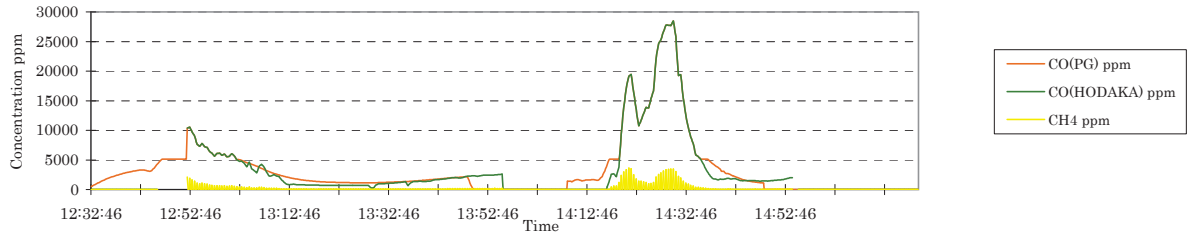
NOX,SO2,CO(Horiba),T



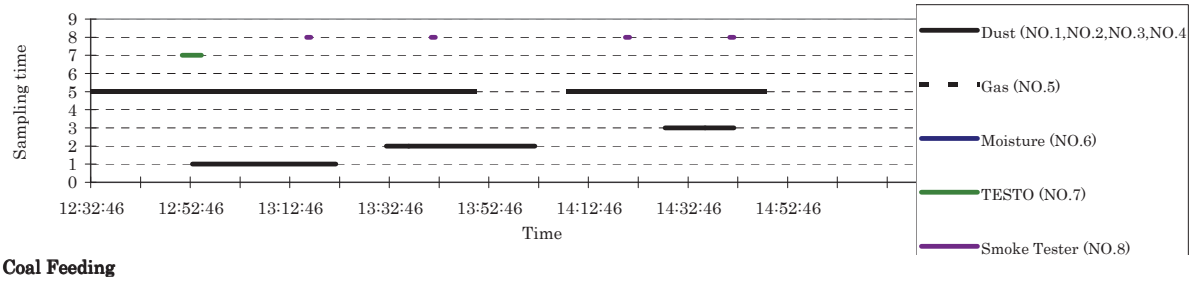
CO2,O2



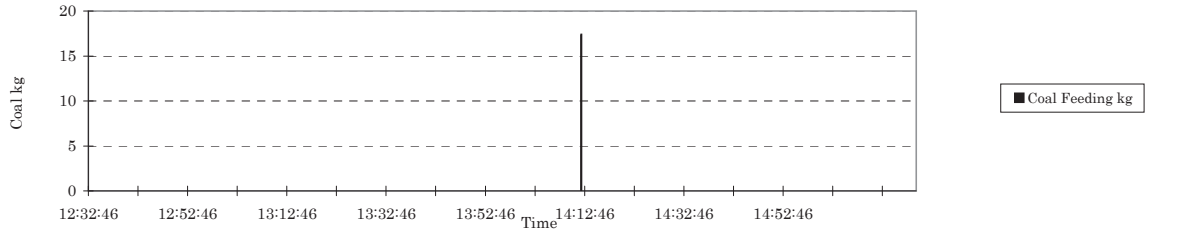
CO(PG-250),CO(HODAKA)



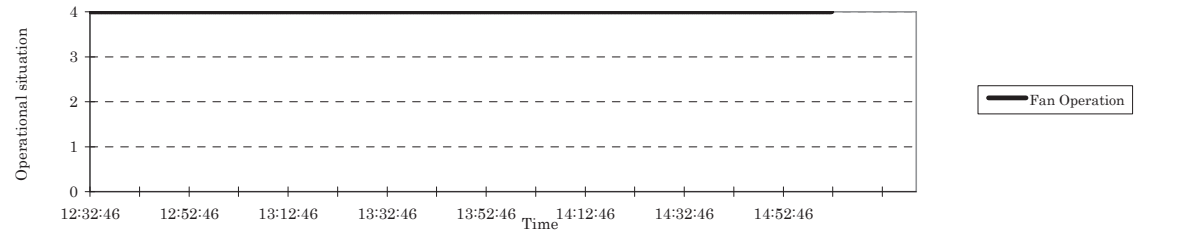
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

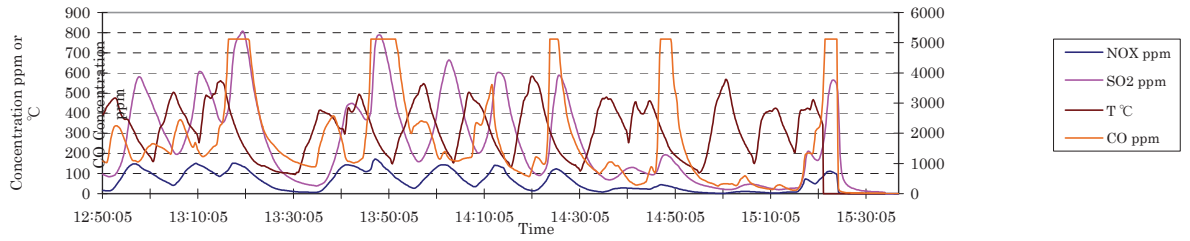
Graph of Measurement Result

Date:	2011/12/9
Place:	Tavan gan
HOB type:	CLSG25
Boiler Capacity (kW):	0.25
Cross sectional area of duct (m2):	0.049
Type of Coal:	Nalaikh

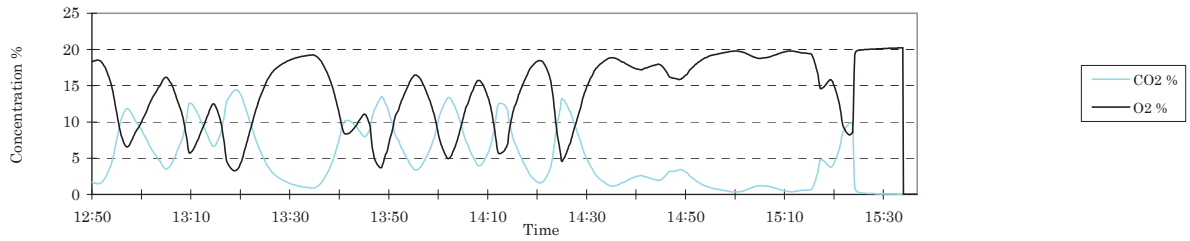
Comment:

HODAKA did't work in the first half of the measurement.

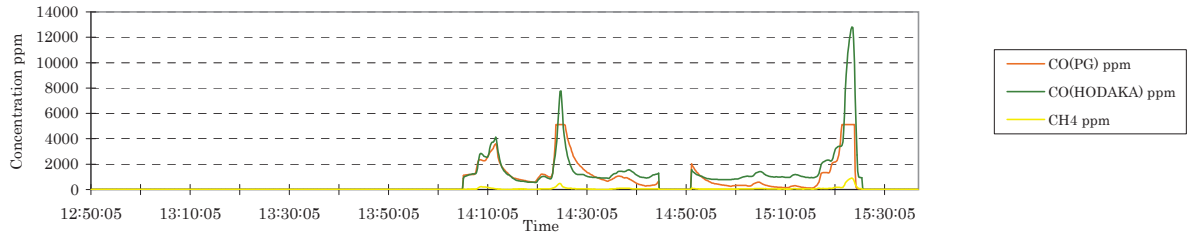
NOX,SO2,CO(Horiba),T



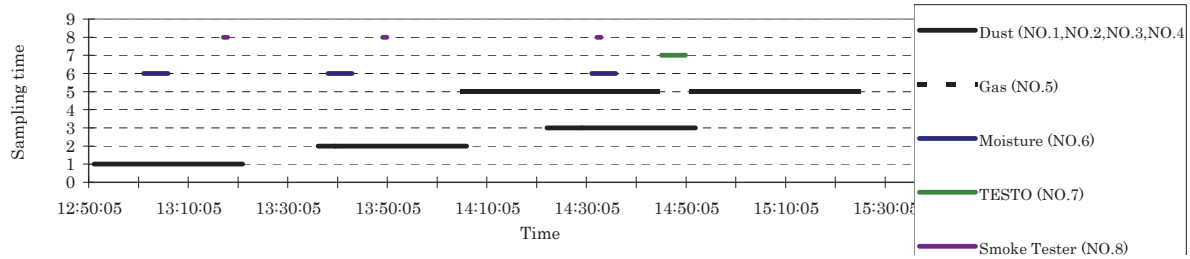
CO2,O2



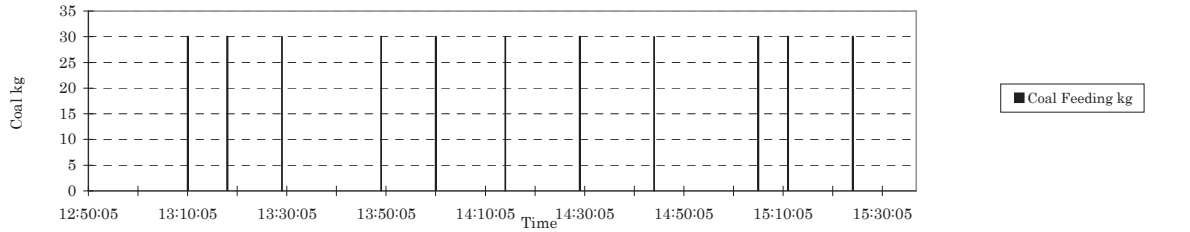
CO(PG-250),CO(HODAKA)



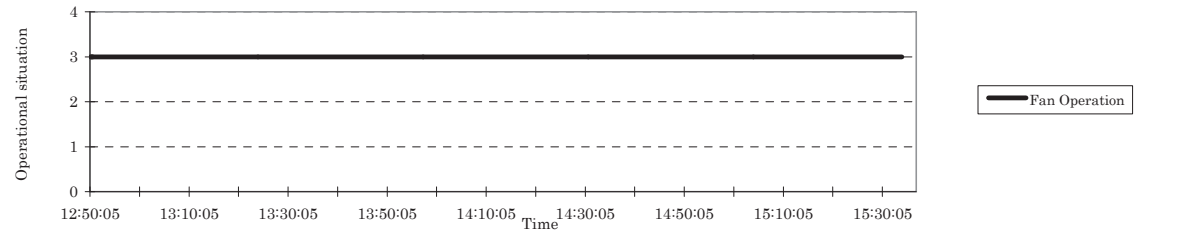
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



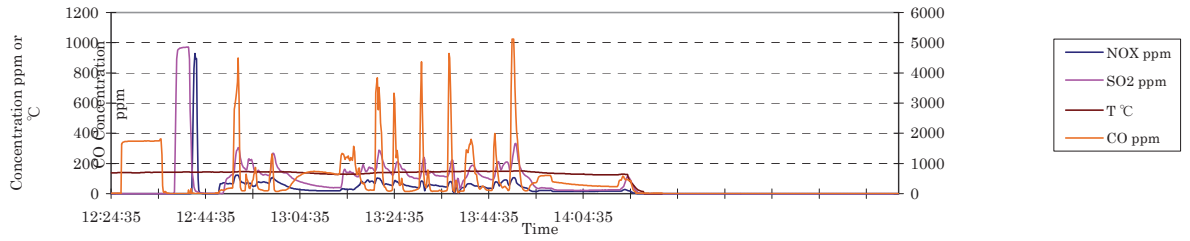
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

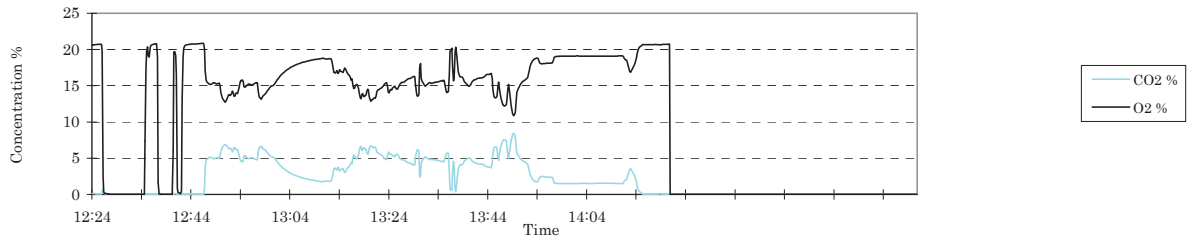
Date:	2011/12/14
Place:	MCS Tiger beer
HOB type:	DZL4
Boiler Capacity (kW):	4.00
Cross sectional area of duct (m2):	0.119
Type of Coal:	Nalaikh

Comment:

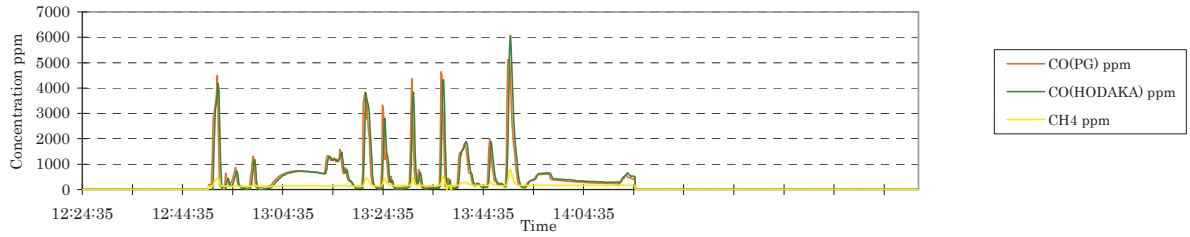
NOX,SO2,CO(Horiba),T



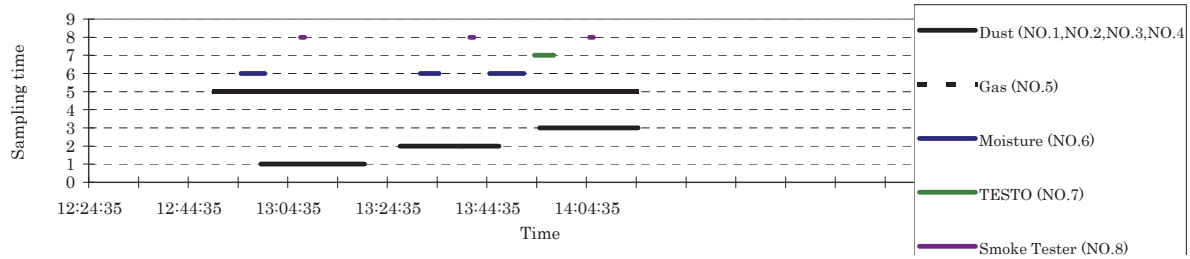
CO2,O2



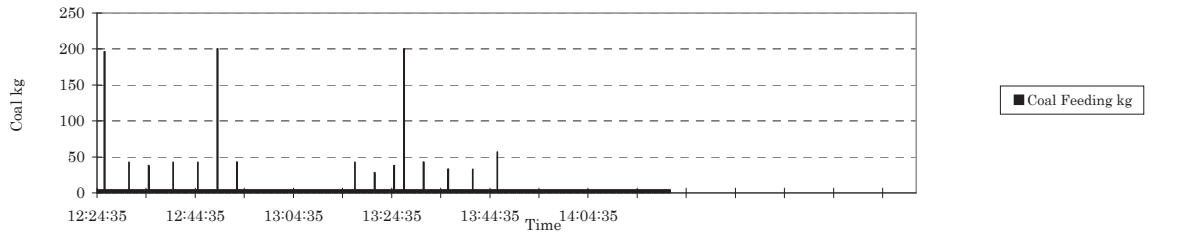
CO(PG-250),CO(HODAKA)



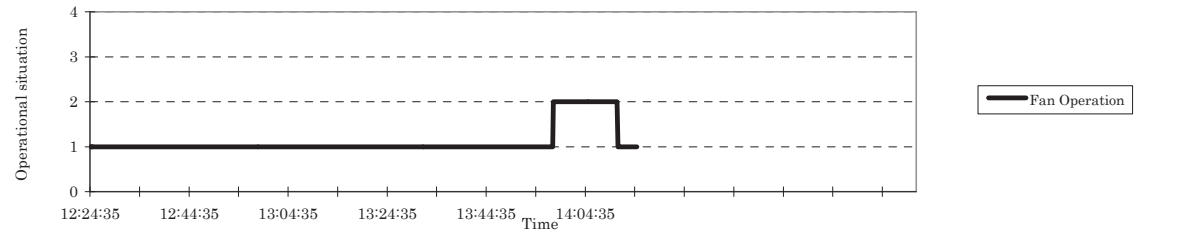
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



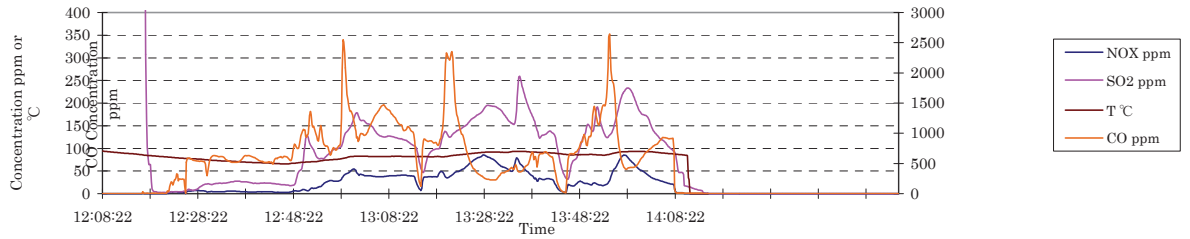
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

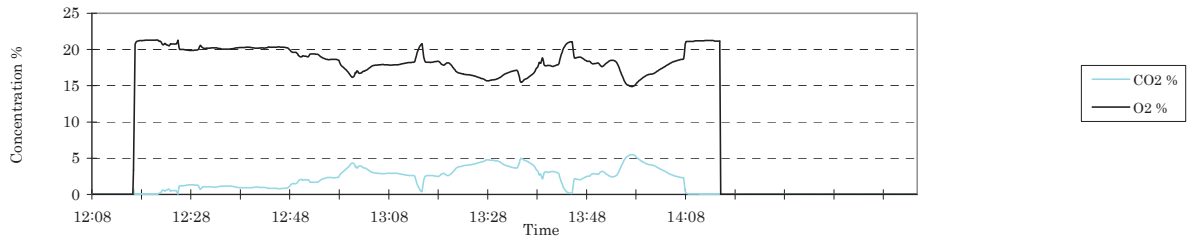
Date:	2011/12/16
Place:	Ikhzasag university-3
HOB type:	1900/1/0
Boiler Capacity (kW):	0.00
Cross sectional area of duct (m2):	0.201
Type of Coal:	Nalaikh

Comment:

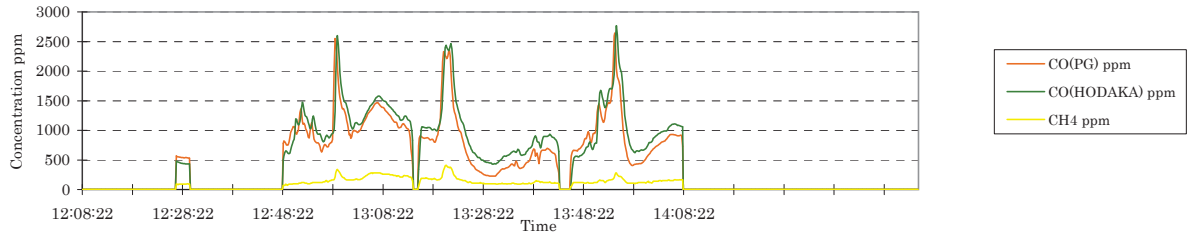
NOX,SO2,CO(Horiba),T



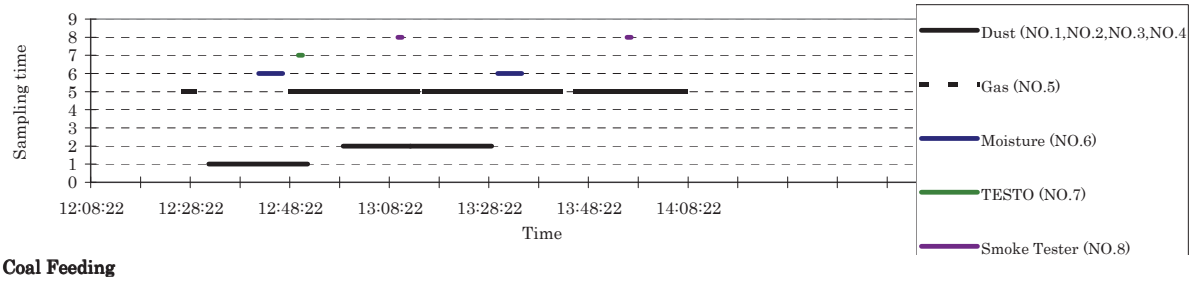
CO2,O2



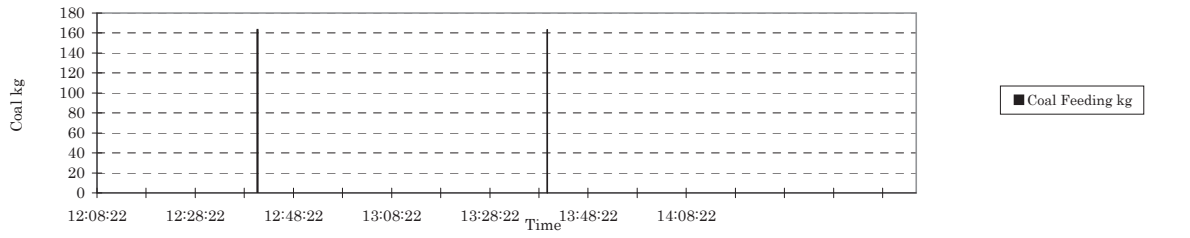
CO(PG-250),CO(HODAKA)



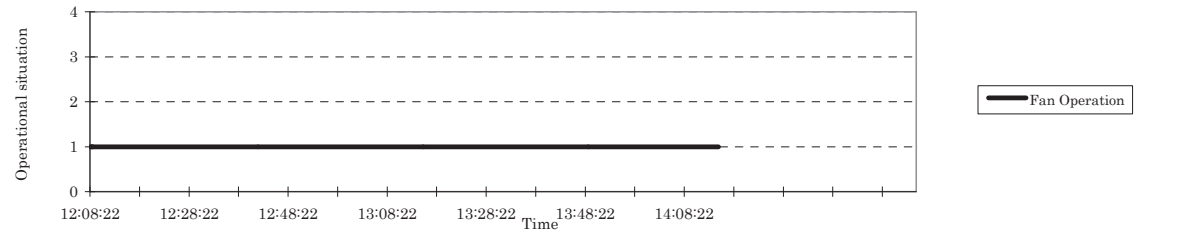
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



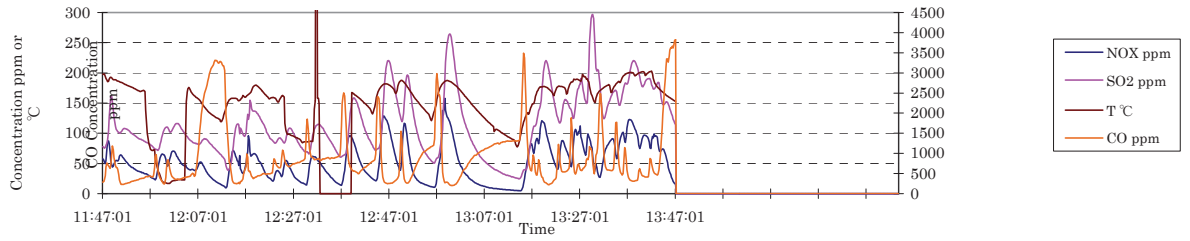
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

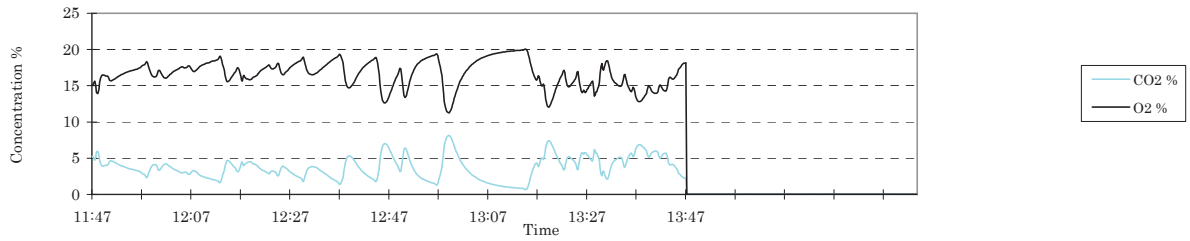
Date:	2011/12/20
Place:	NO.60 secondary schoo
HOB type:	MUHT
Boiler Capacity (kW):	0.70
Cross sectional area of duct (m2):	0.075
Type of Coal:	Nalaikh

Comment:

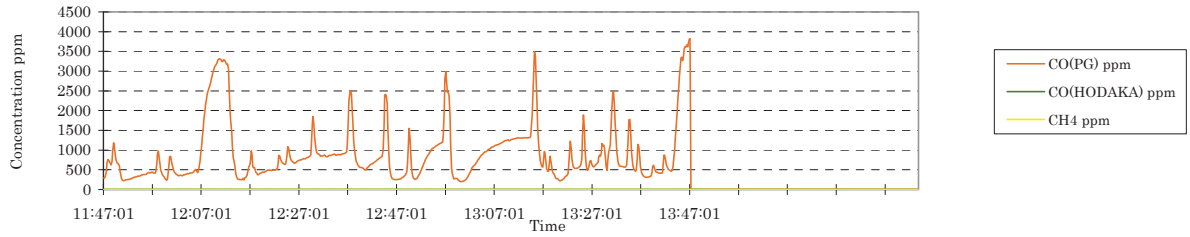
NOX,SO2,CO(Horiba),T



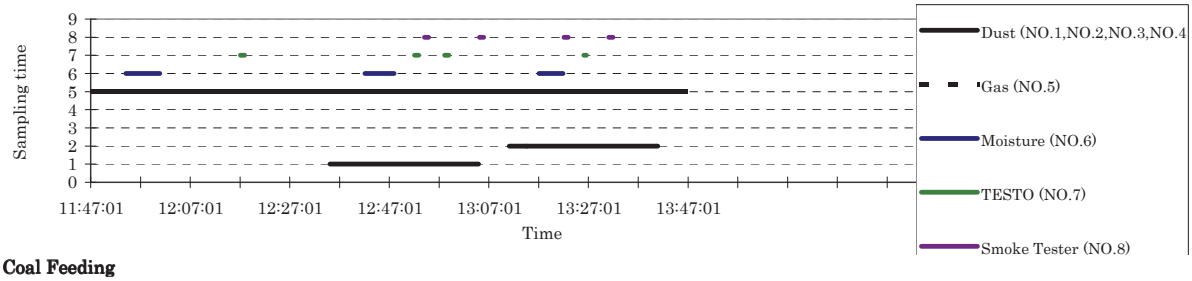
CO2,O2



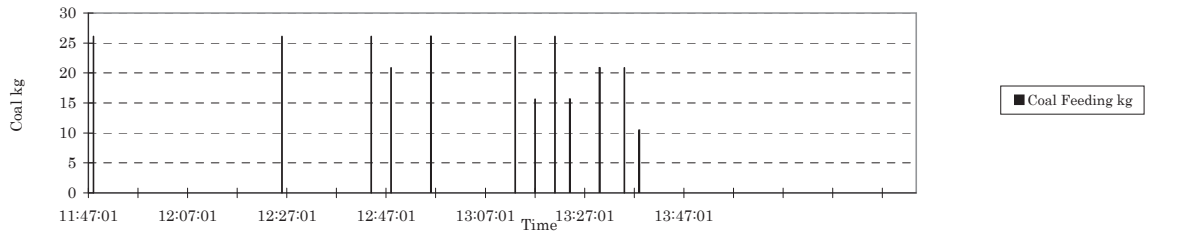
CO(PG-250),CO(HODAKA)



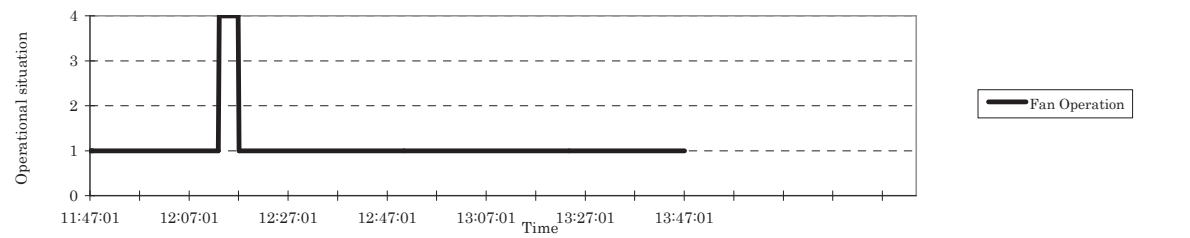
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



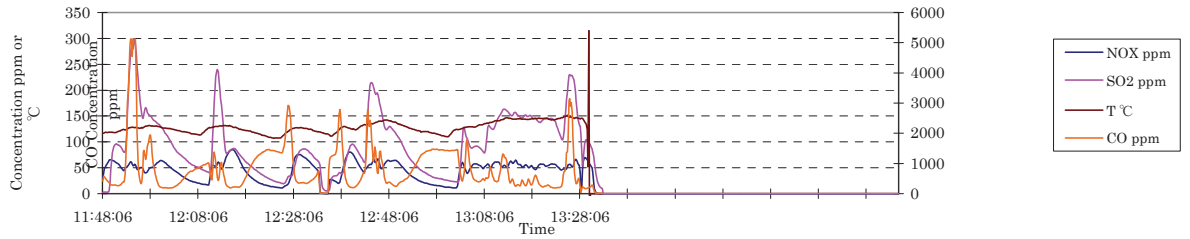
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

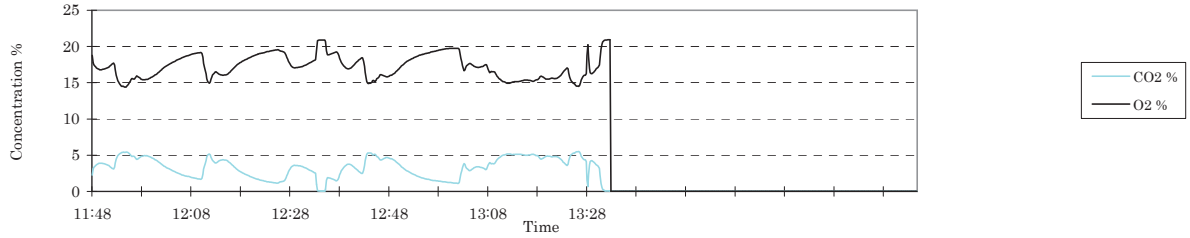
Date:	2011/12/22
Place:	kyoyulaakhuu
HOB type:	HP-18-54
Boiler Capacity (kW):	0.40
Cross sectional area of duct (m2):	0.785
Type of Coal:	Nalaikh+excrement

Comment:

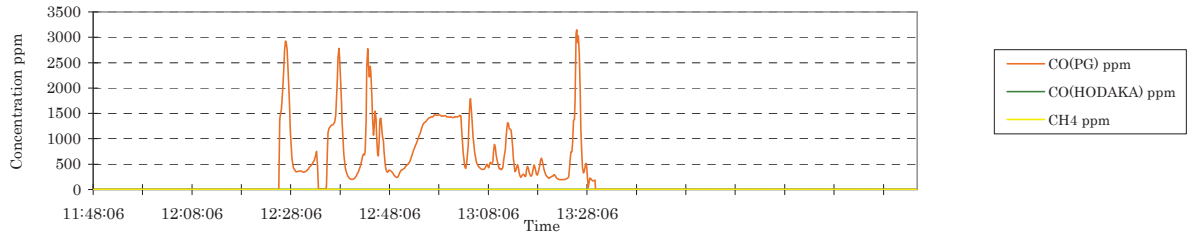
NOX,SO2,CO(Horiba),T



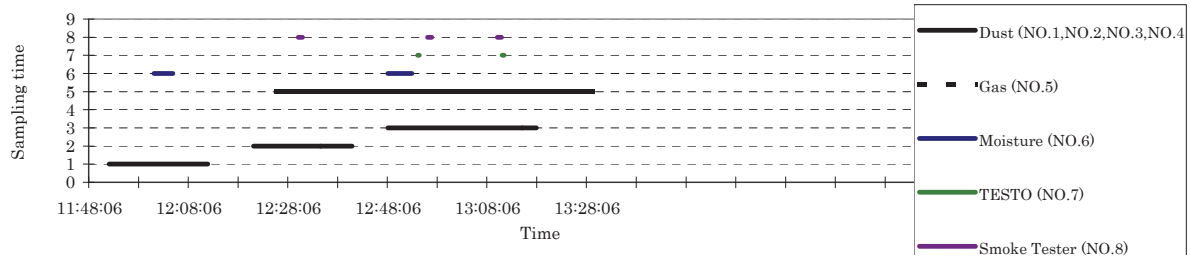
CO2,O2



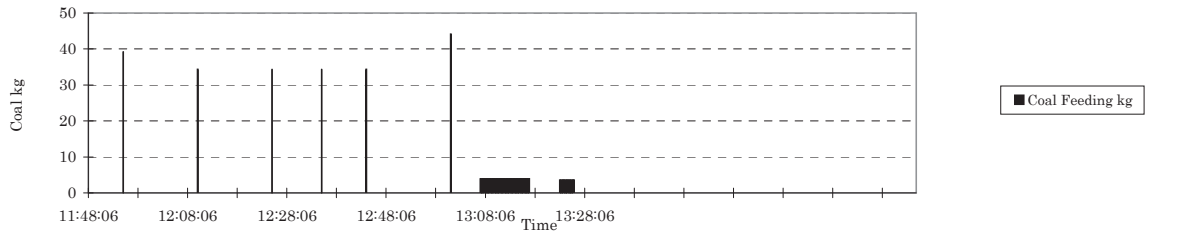
CO(PG-250),CO(HODAKA)



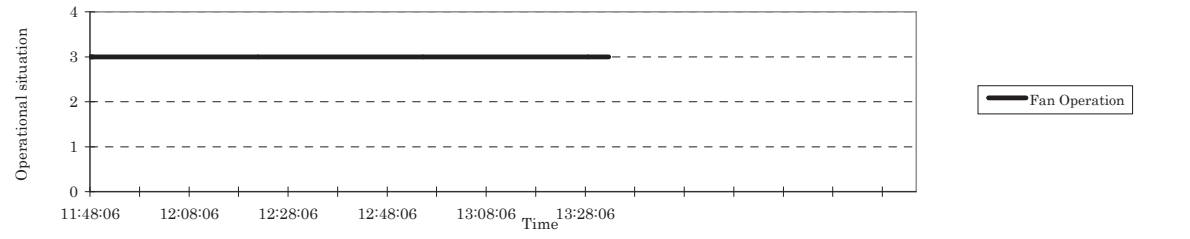
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



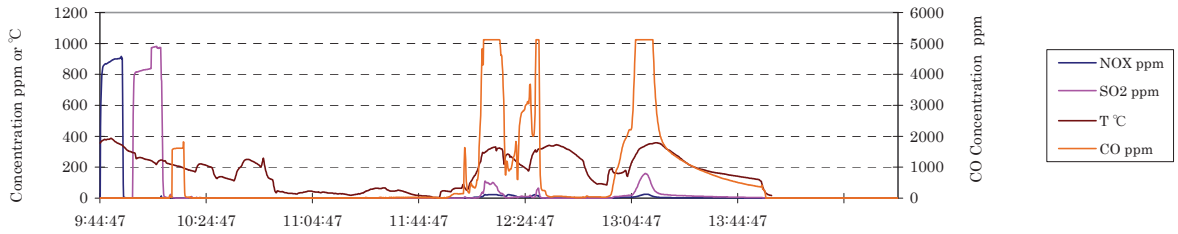
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

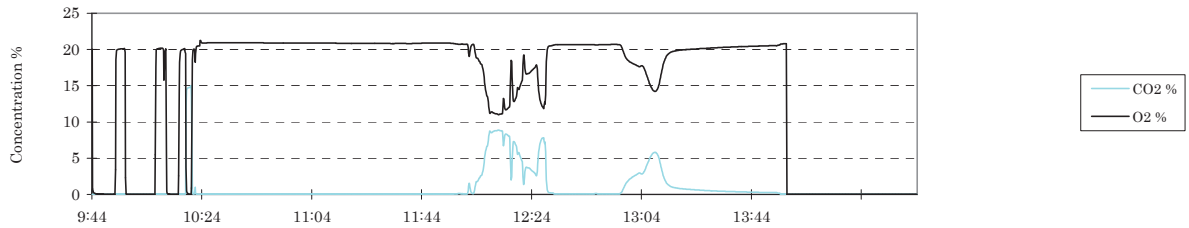
Date:	2011/12/27
Place:	Obi's ger
HOB type:	traditional ger stove
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.009
Type of Coal:	wood + Nalaikh coal

Comment:

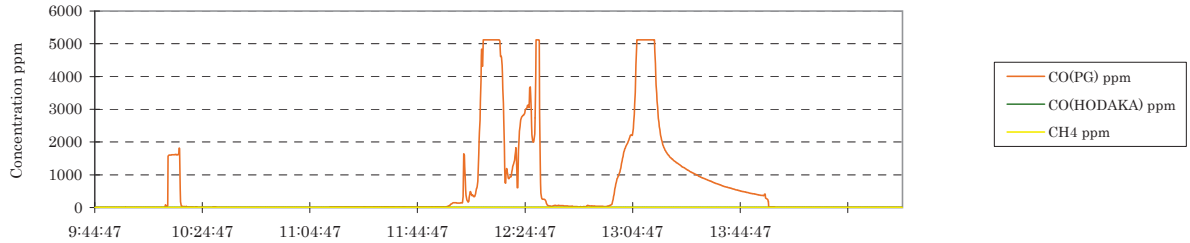
NOX,SO2,CO(Horiba),T



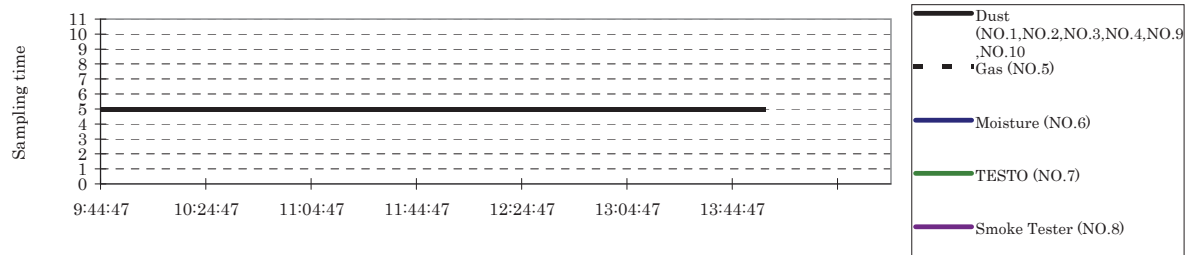
CO2,O2



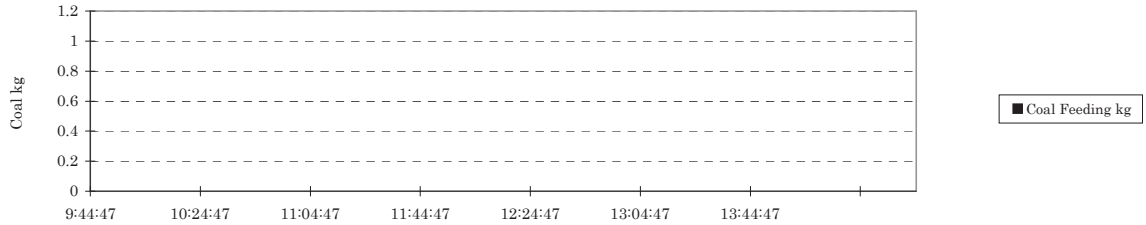
CO(PG-250),CO(HODAKA)



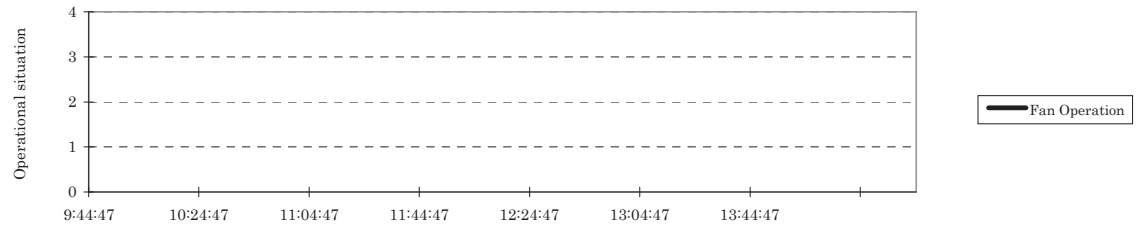
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

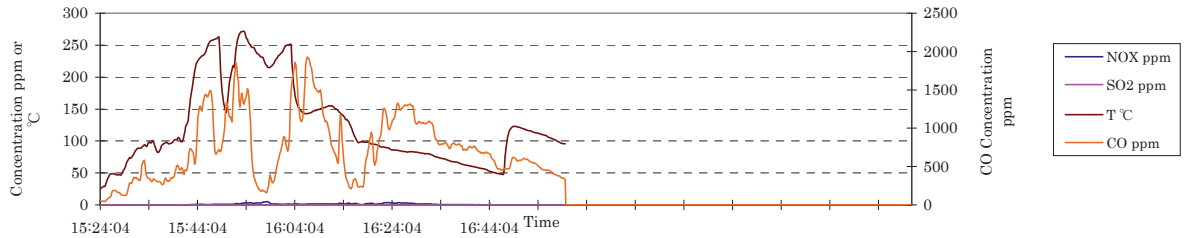
Graph of Measurement Result

Date:	2011/12/28
Place:	Obi's ger
HOB type:	traditional ger stove
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.009
Type of Coal:	wood only

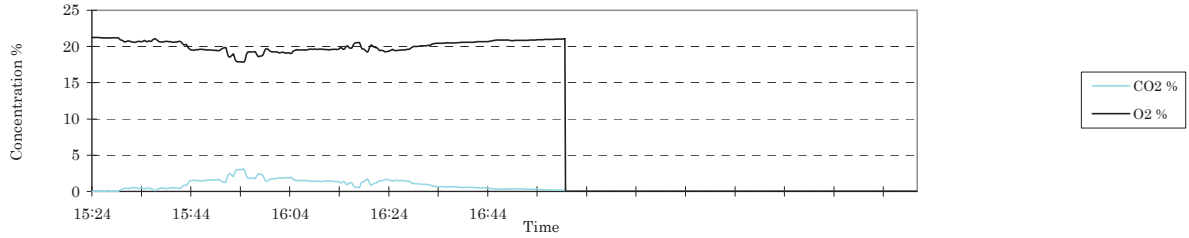
Comment:

Fuel is only woods.

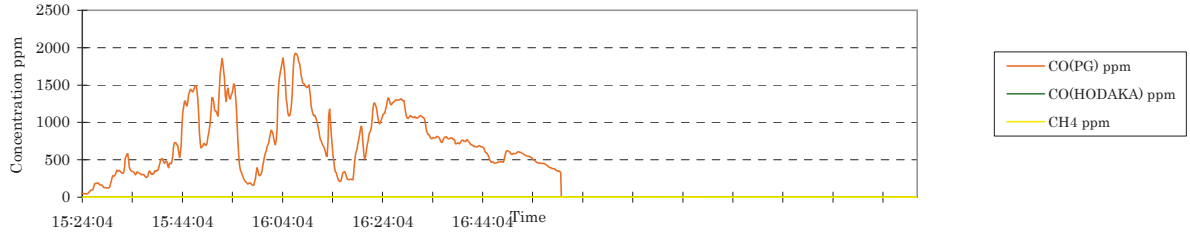
NOX,SO2,CO(Horiba),T



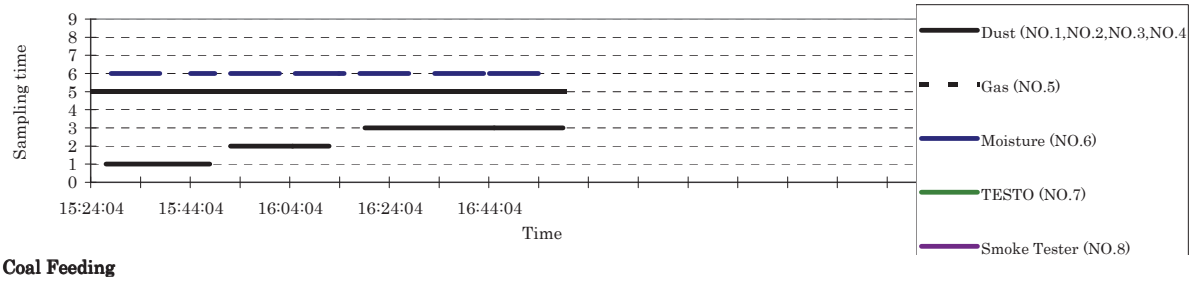
CO2,O2



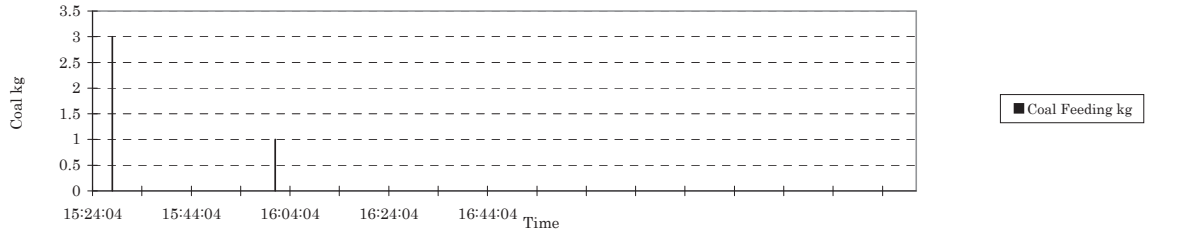
CO(PG-250),CO(HODAKA)



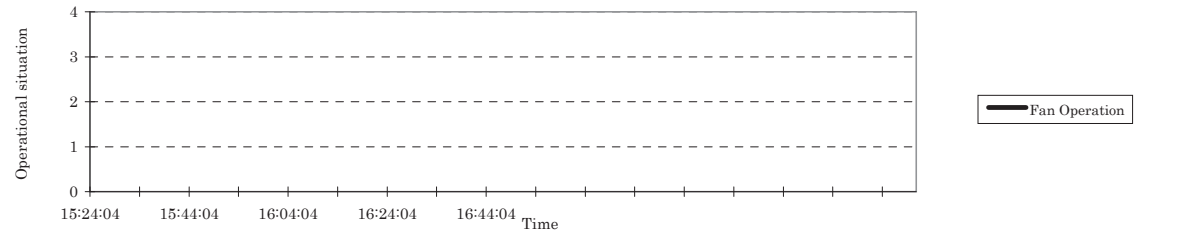
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



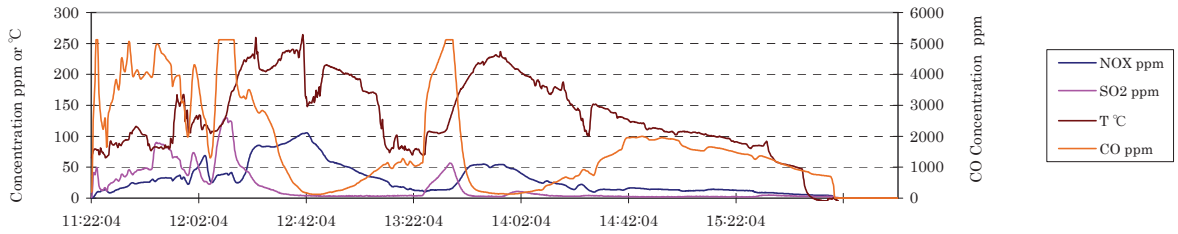
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

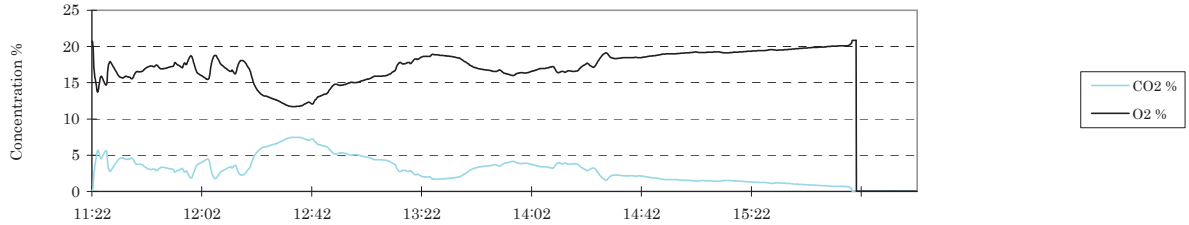
Date:	2011/12/29
Place:	Obi's ger
HOB type:	traditional ger stove
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.009
Type of Coal:	wood + Nalaikh coal

Comment:

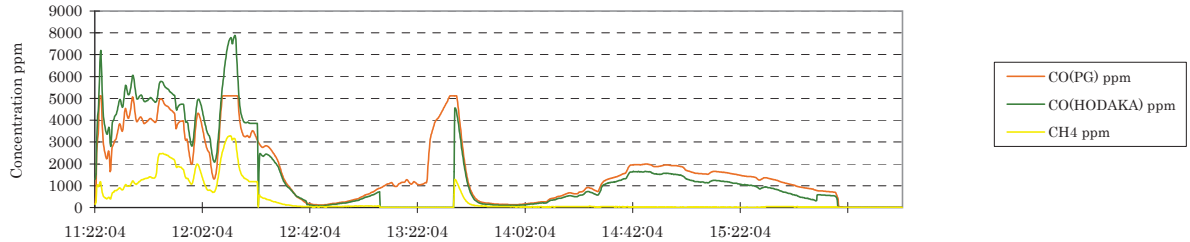
NOX,SO2,CO(Horiba),T



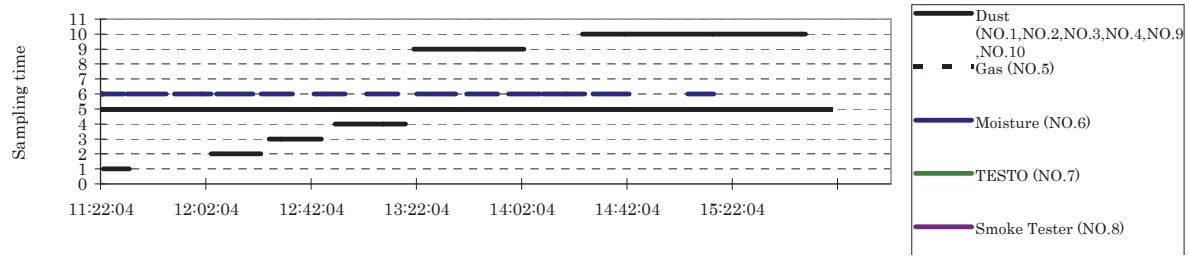
CO2,O2



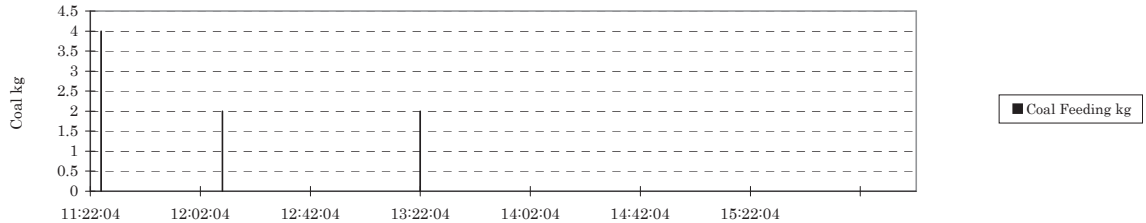
CO(PG-250),CO(HODAKA)



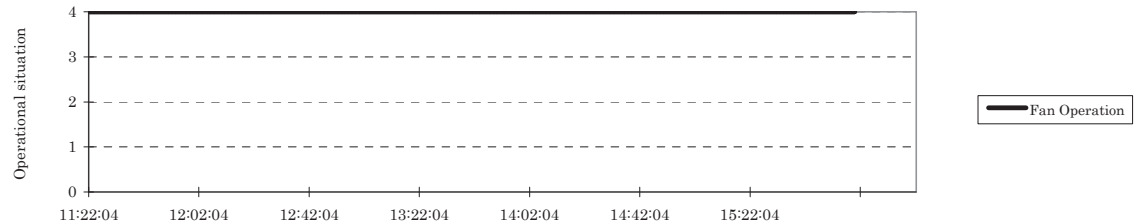
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



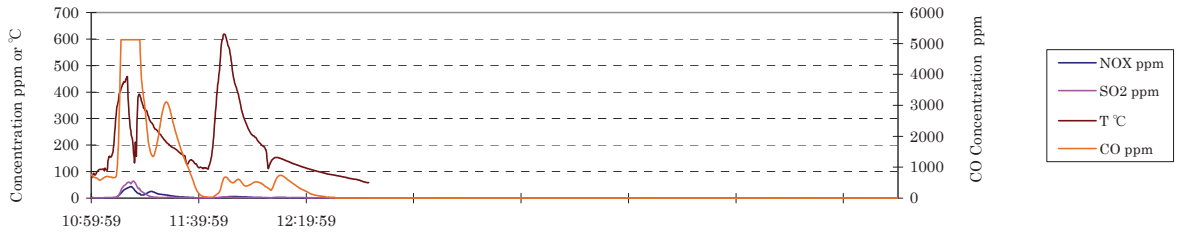
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

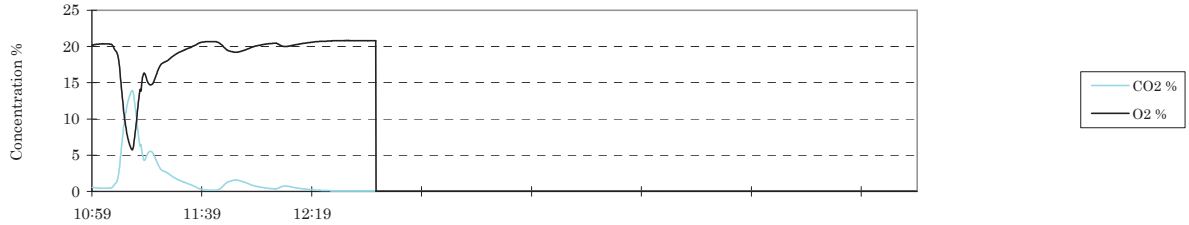
Date:	2011/12/30
Place:	Obi's ger
HOB type:	turky ger stove
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.013
Type of Coal:	wood only

Comment:

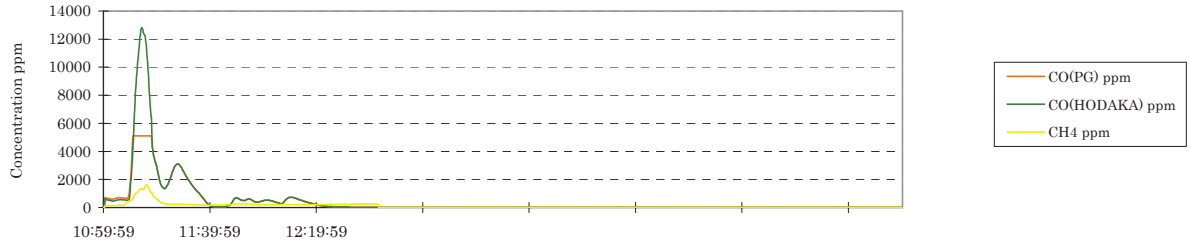
NOX,SO2,CO(Horiba),T



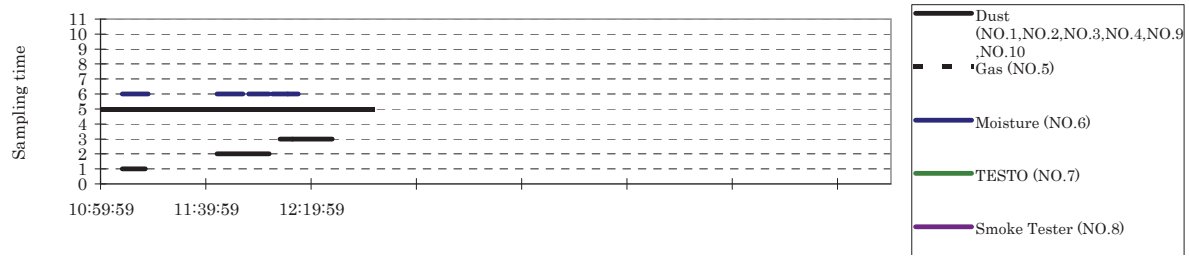
CO2,O2



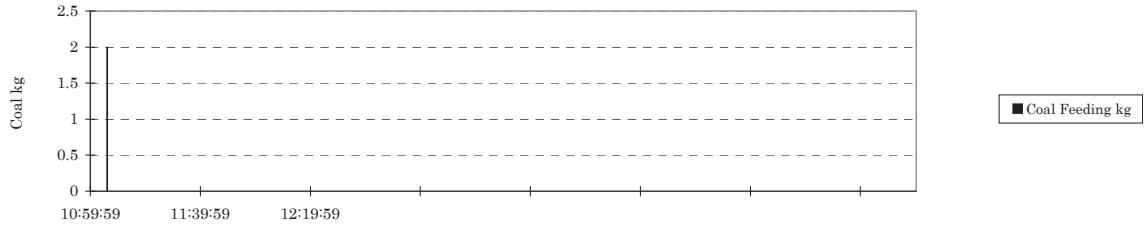
CO(PG-250),CO(HODAKA)



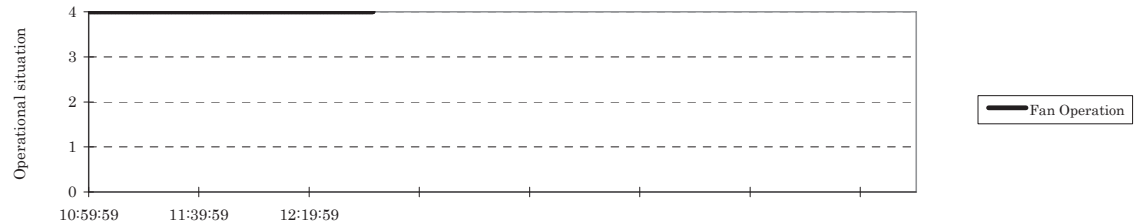
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



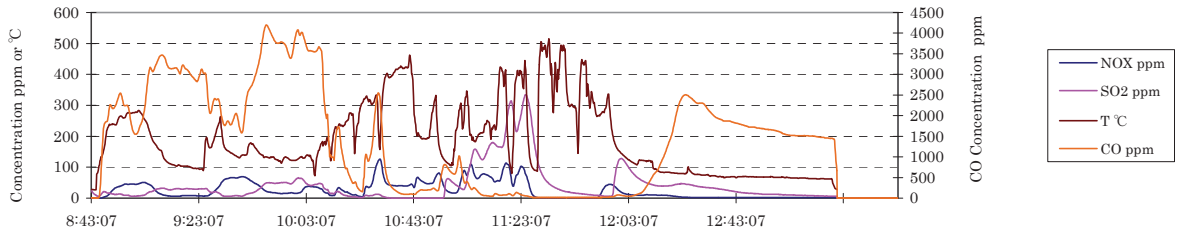
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

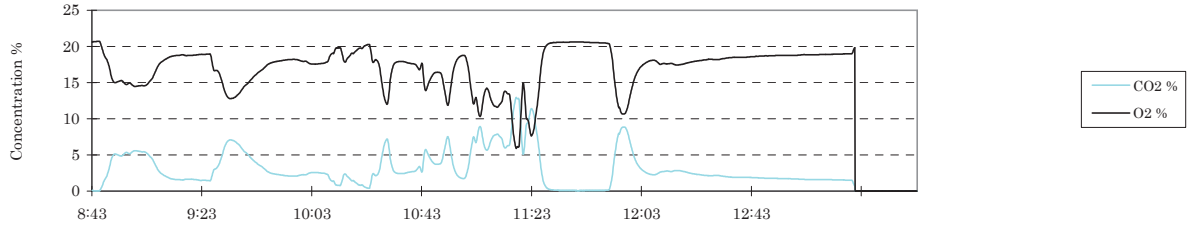
Date:	2011/12/31
Place:	Obi's ger
HOB type:	turky ger stove
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.013
Type of Coal:	wood + Nalaikh coal

Comment:

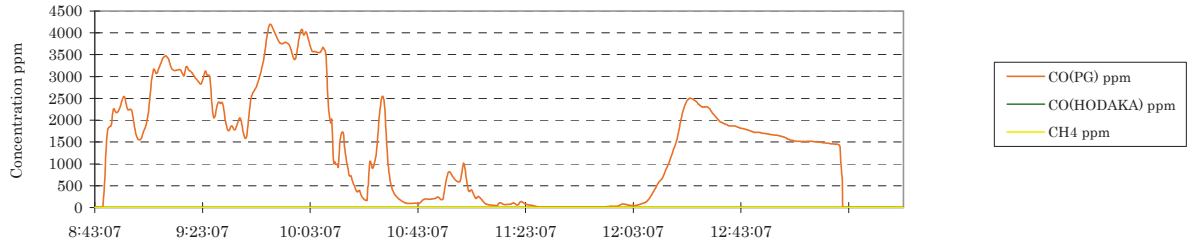
NOX,SO2,CO(Horiba),T



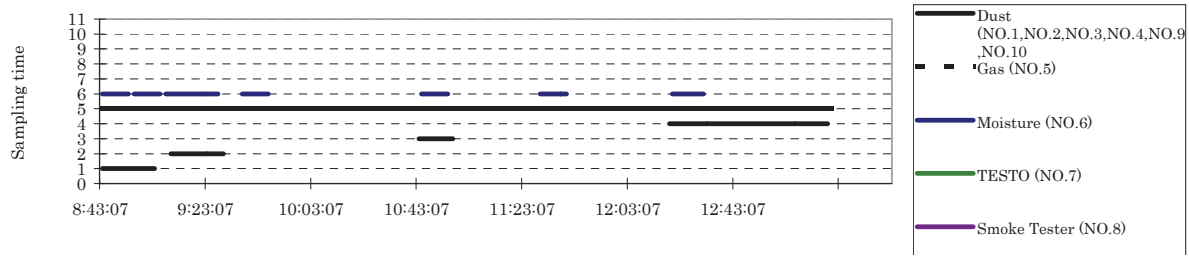
CO2,O2



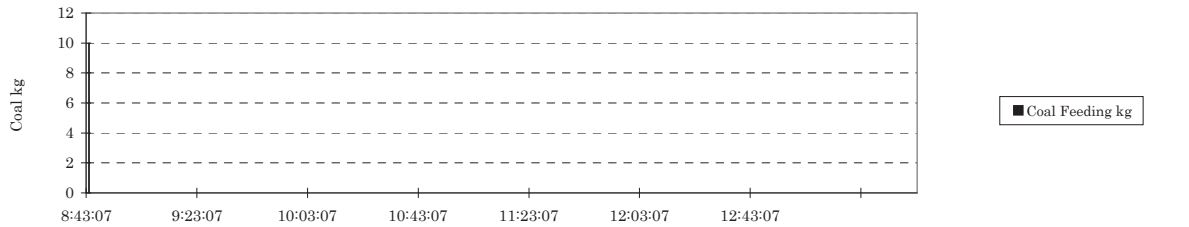
CO(PG-250),CO(HODAKA)



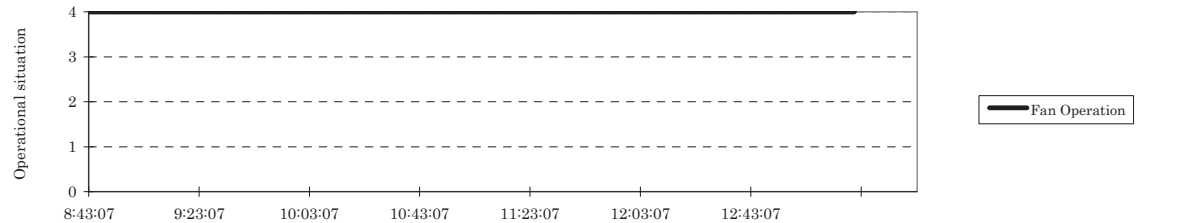
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



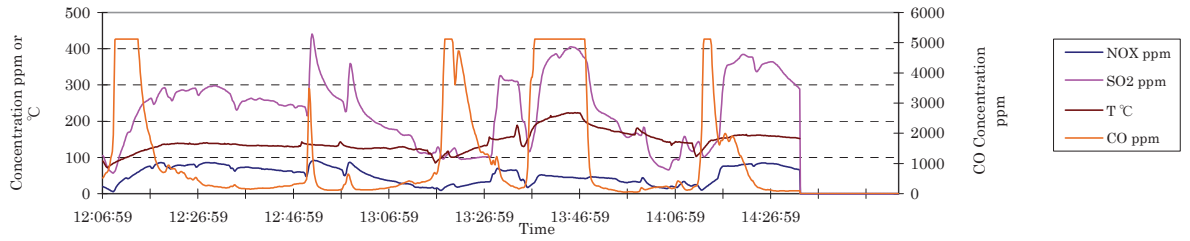
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

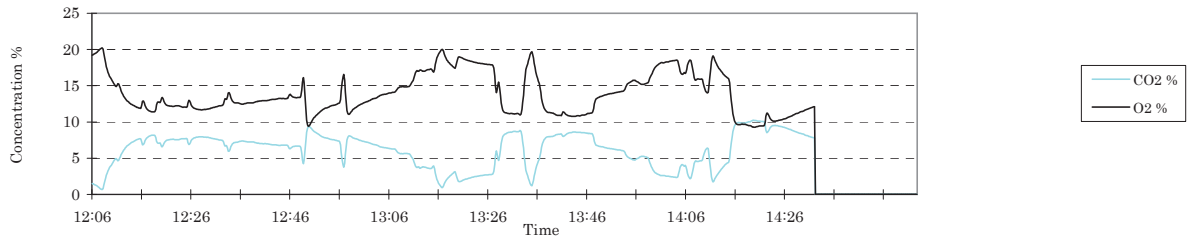
Date:	2012/1/4
Place:	O.113 secondary scho
HOB type:	MDZ-0.25
Boiler Capacity (kW):	0.25
Cross sectional area of duct (m2):	0.091
Type of Coal:	Nalaikh

Comment:

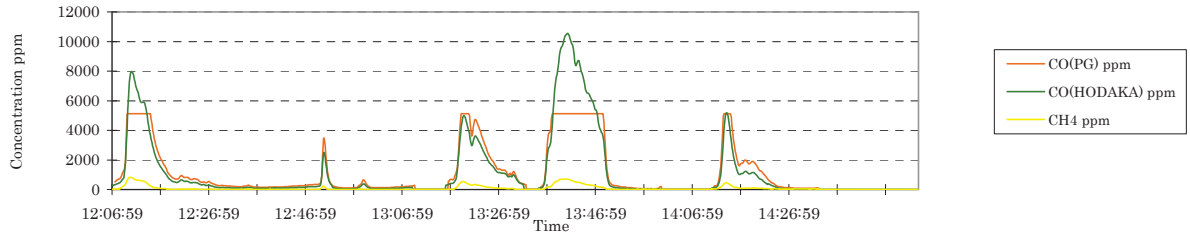
NOX,SO2,CO(Horiba),T



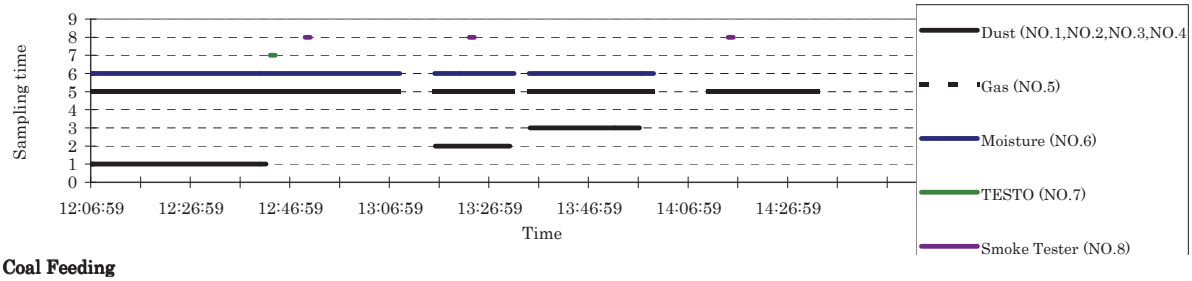
CO2,O2



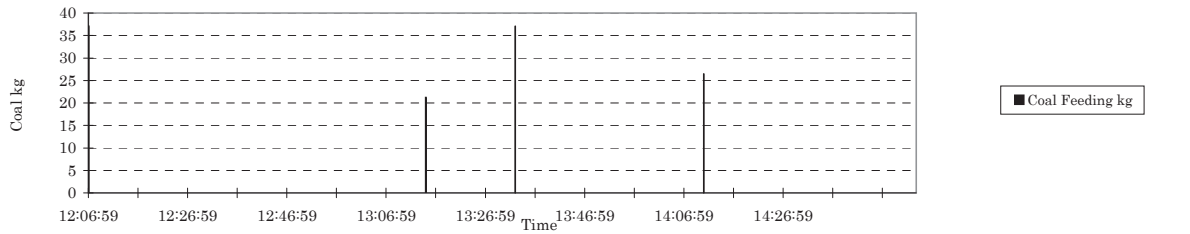
CO(PG-250),CO(HODAKA)



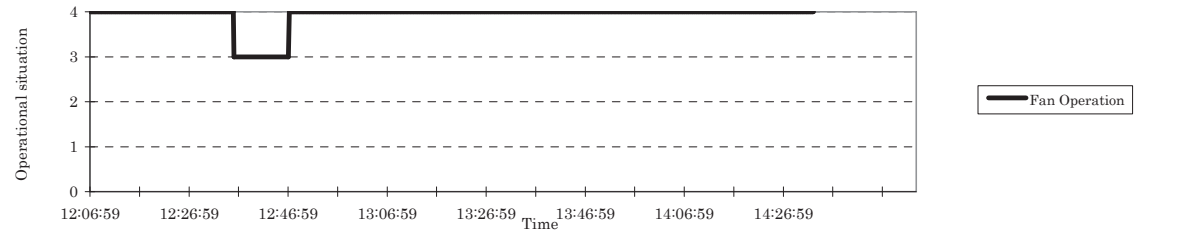
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



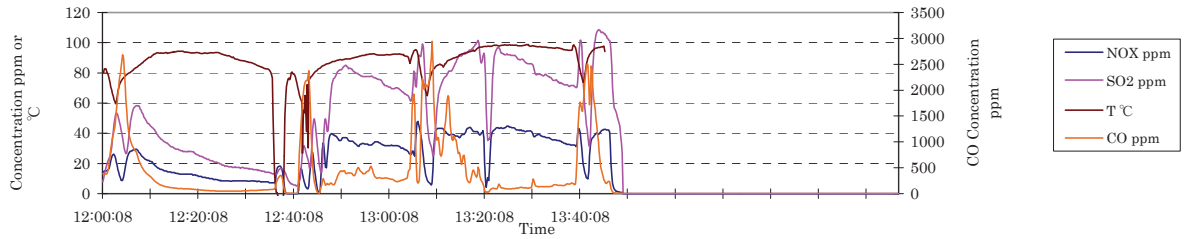
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

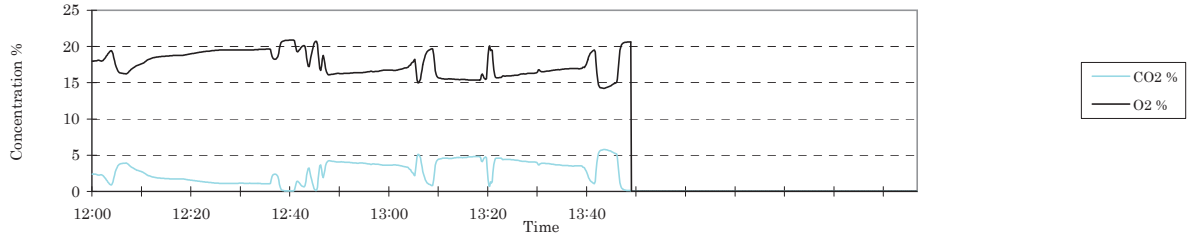
Date:	2012/1/5
Place:	NO.92 school
HOB type:	MDZ-063
Boiler Capacity (kW):	0.63
Cross sectional area of duct (m2):	0.233
Type of Coal:	Nalaikh

Comment:

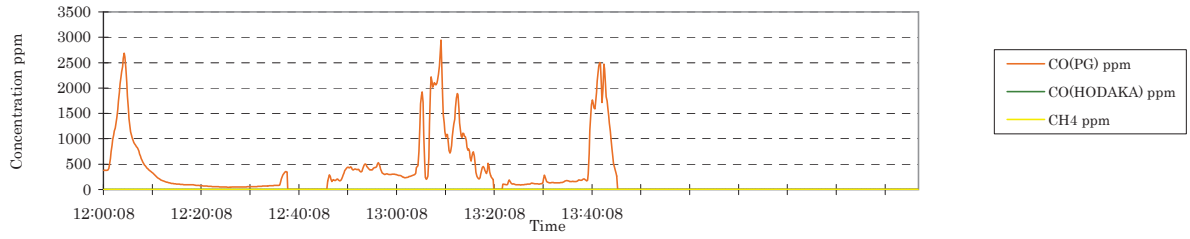
NOX,SO2,CO(Horiba),T



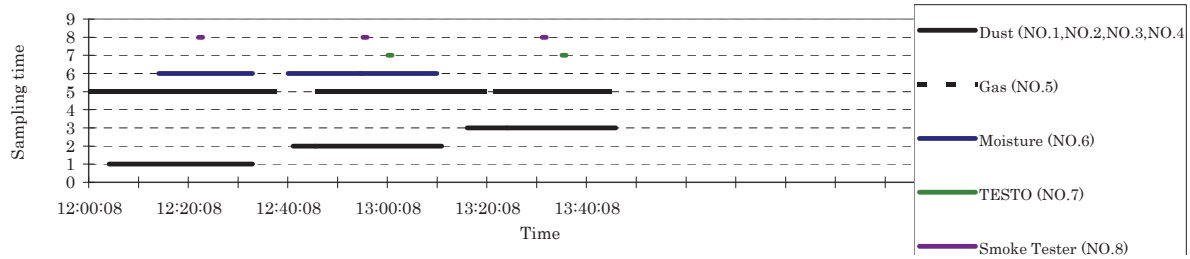
CO2,O2



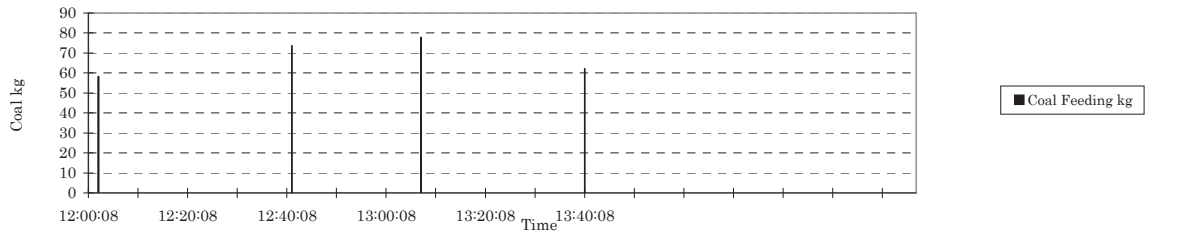
CO(PG-250),CO(HODAKA)



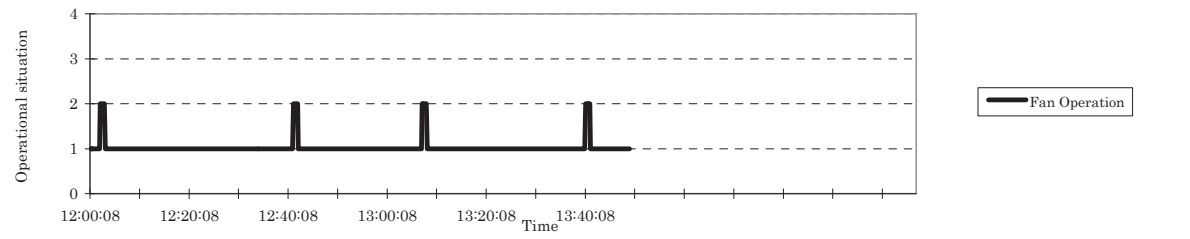
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



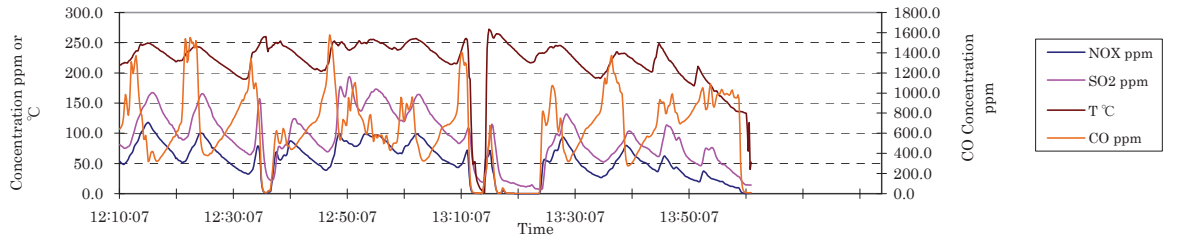
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

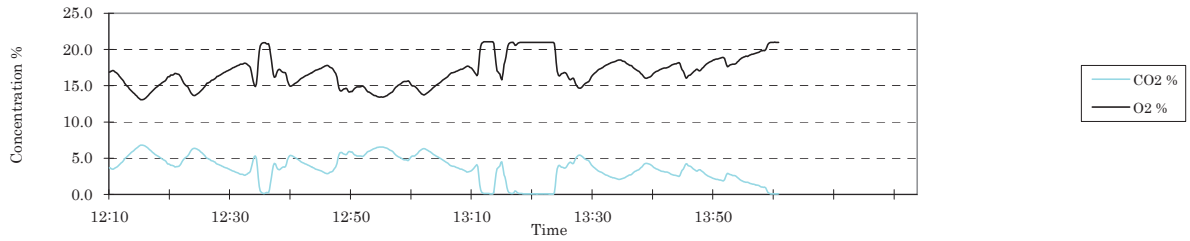
Date:	2012/1/6
Place:	Train Repeair
HOB type:	BZUI 100
Boiler Capacity (kW):	0.85
Cross sectional area of duct (m2):	0.636
Type of Coal:	Siveovoo

Comment:

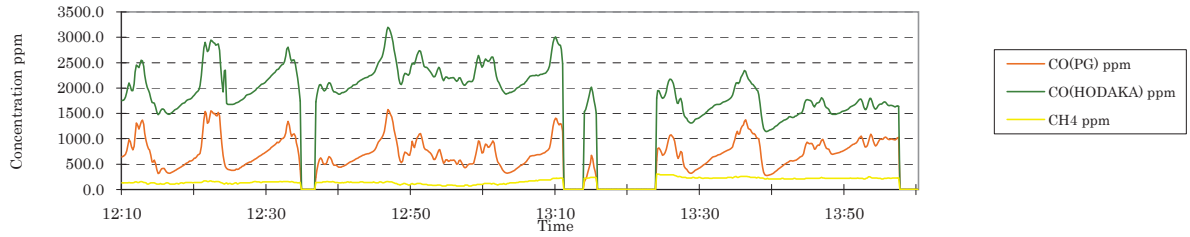
NOX,SO2,CO(Horiba),T



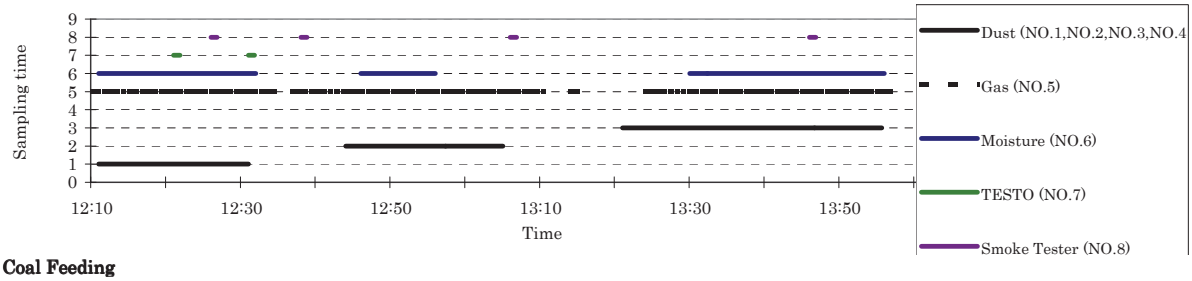
CO2,O2



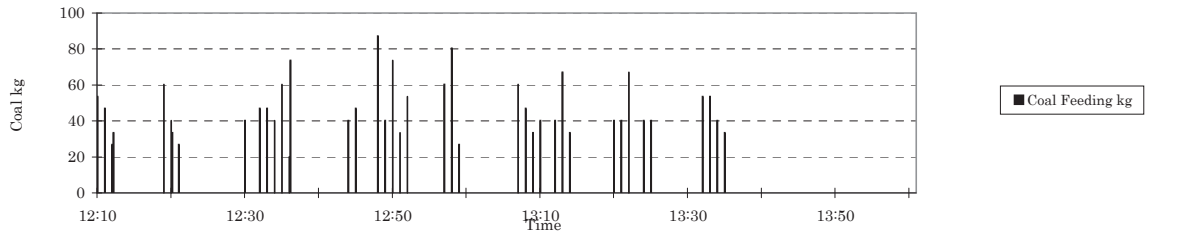
CO(PG-250),CO(HODAKA)



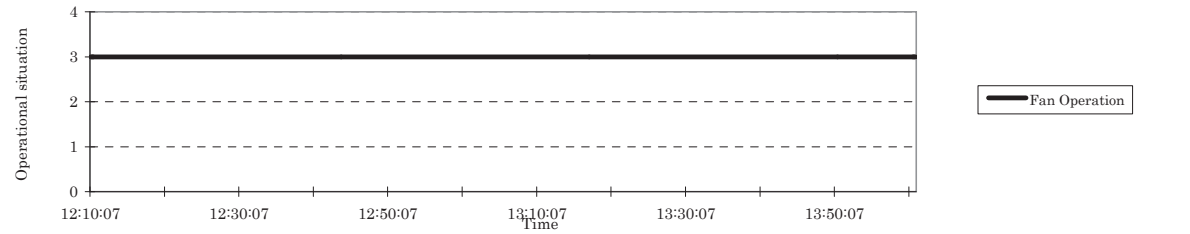
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



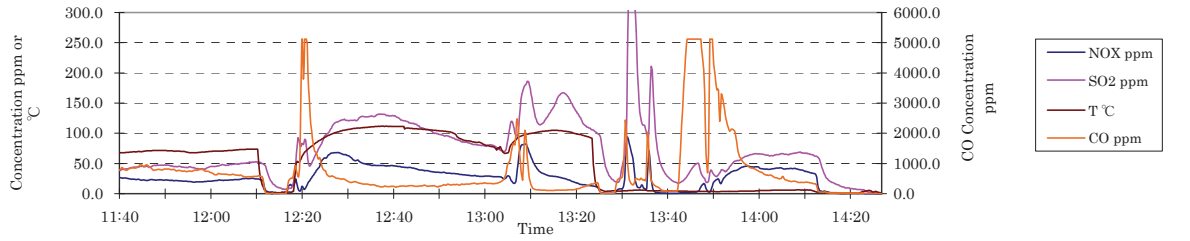
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

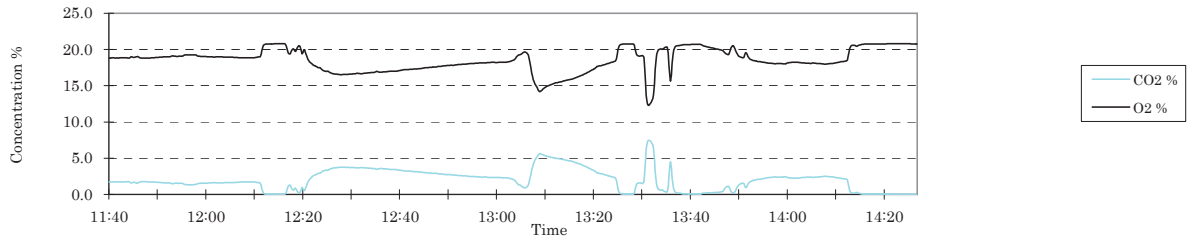
Date:	2012/1/10
Place:	#106 School
HOB type:	Thermochlor-0.3
Boiler Capacity (kW):	0.35
Cross sectional area of duct (m2):	0.085
Type of Coal:	Nalaikh

Comment:

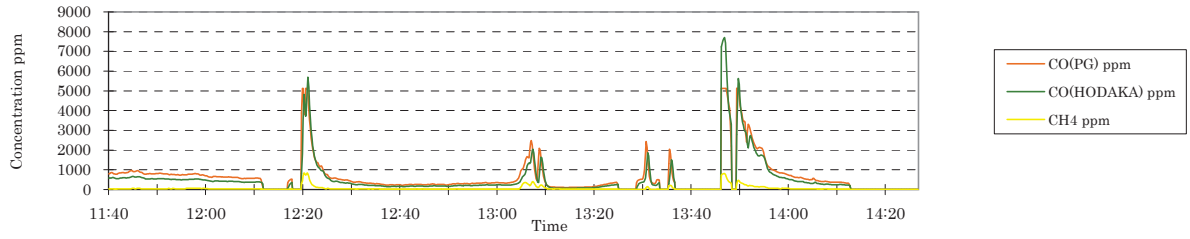
NOX,SO2,CO(Horiba),T



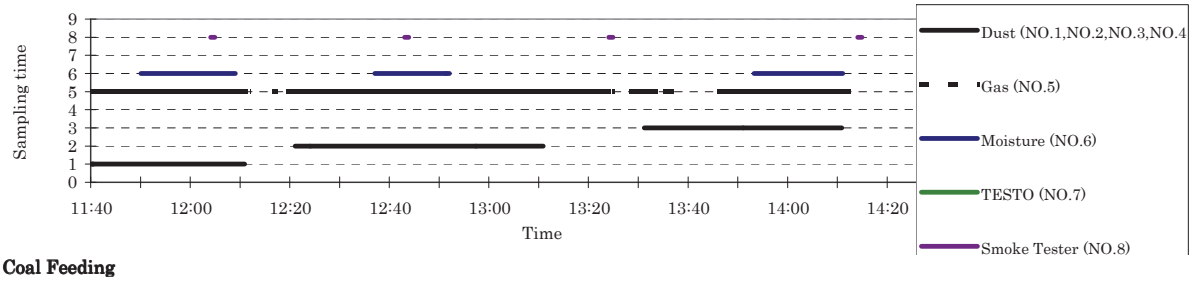
CO2,O2



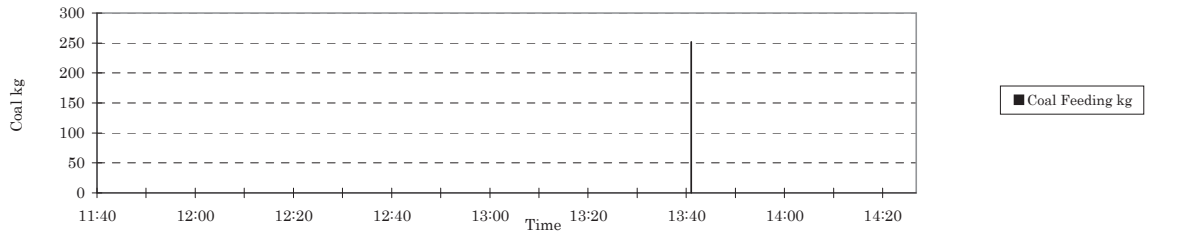
CO(PG-250),CO(HODAKA)



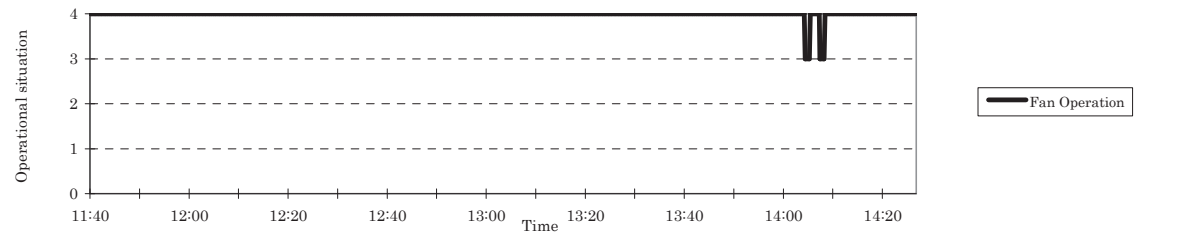
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



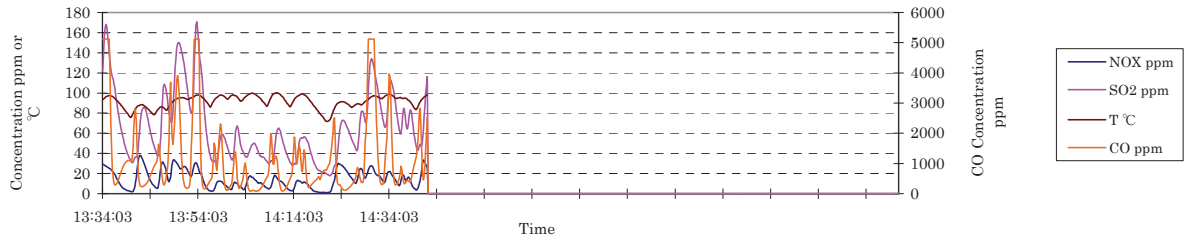
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

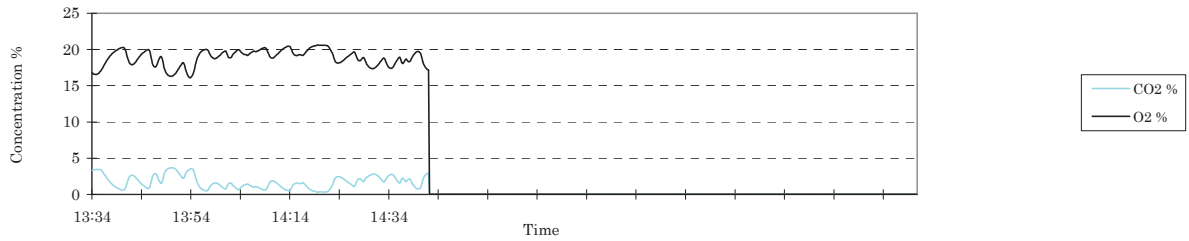
Date:	2012/1/11
Place:	No.88 school
HOB type:	KBPO7KB
Boiler Capacity (kW):	0.70
Cross sectional area of duct (m2):	0.490
Type of Coal:	Nalaikh

Comment:

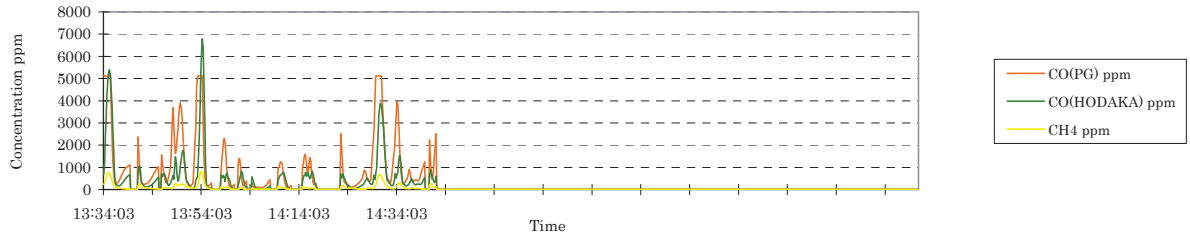
NOX,SO2,CO(Horiba),T



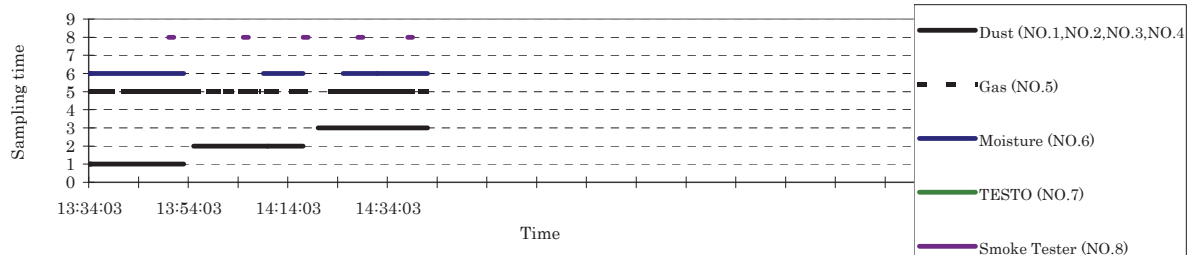
CO2,O2



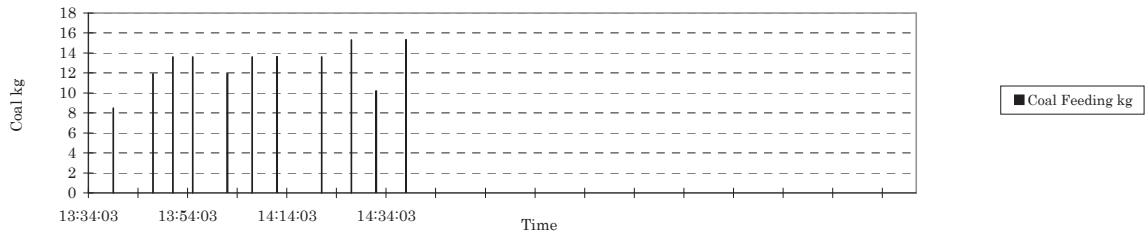
CO(PG-250),CO(HODAKA)



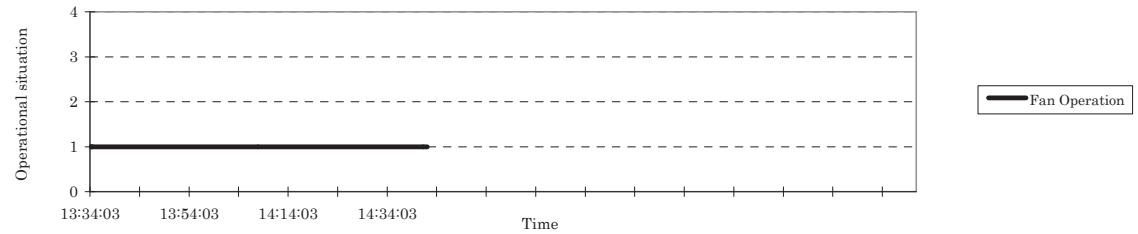
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



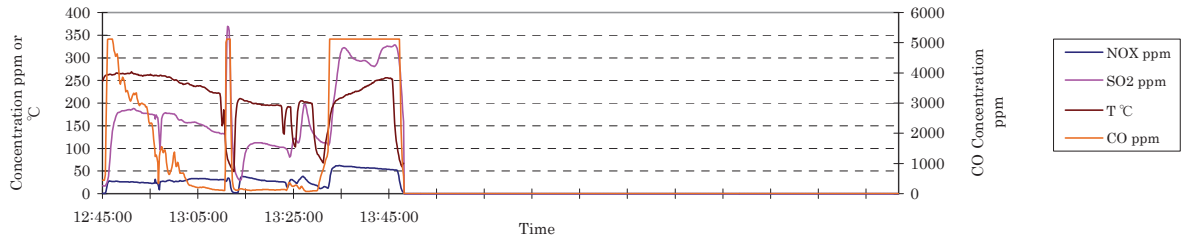
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

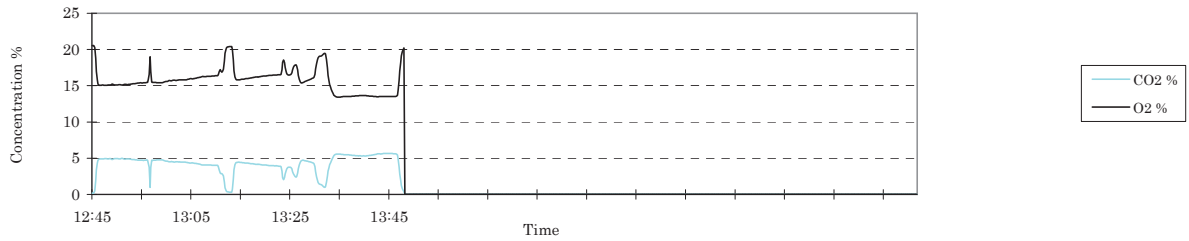
Date:	2012/1/12
Place:	No.46school
HOB type:	CLSG
Boiler Capacity (kW):	0.60
Cross sectional area of duct (m2):	0.028
Type of Coal:	Nalaikh

Comment:

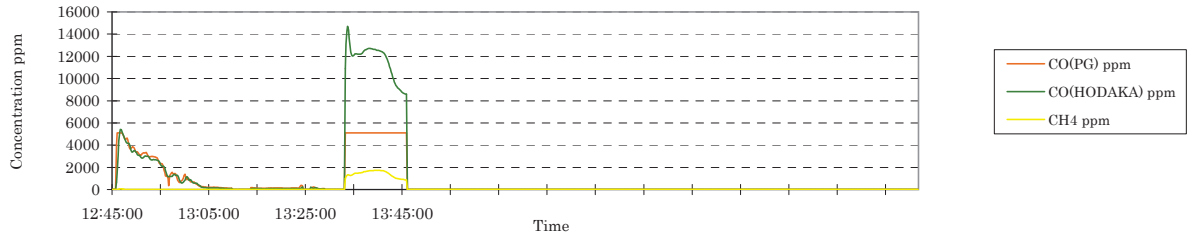
NOX,SO2,CO(Horiba),T



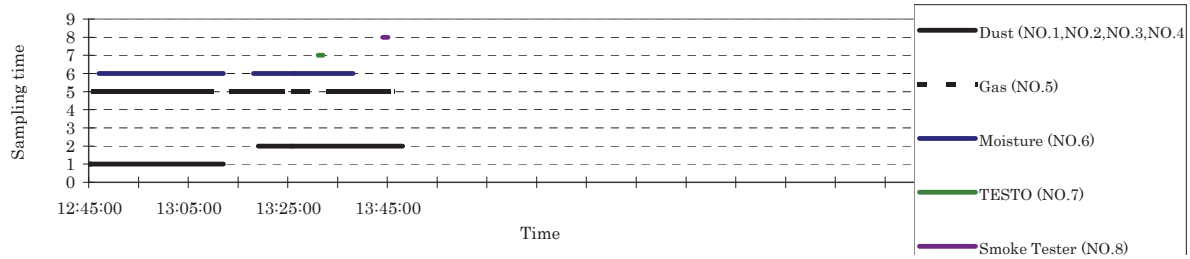
CO2,O2



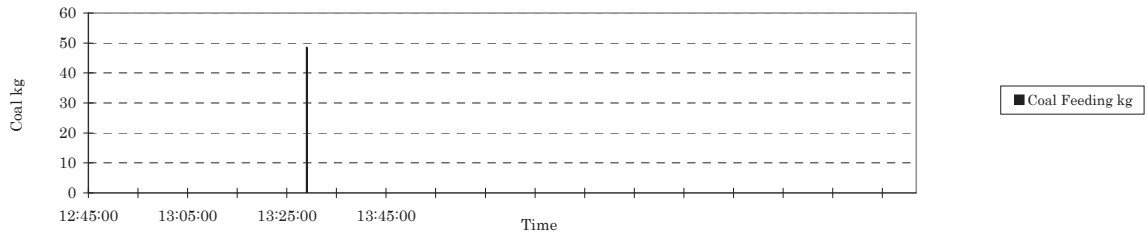
CO(PG-250),CO(HODAKA)



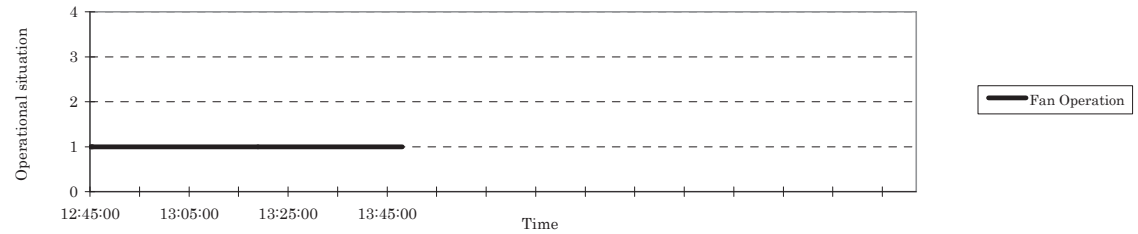
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

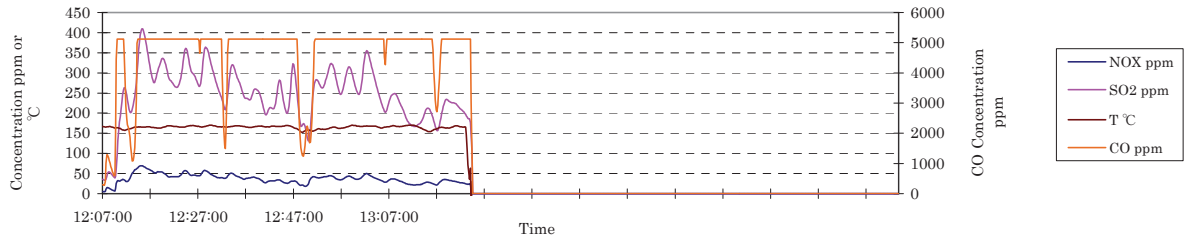
Graph of Measurement Result

Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тооc, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

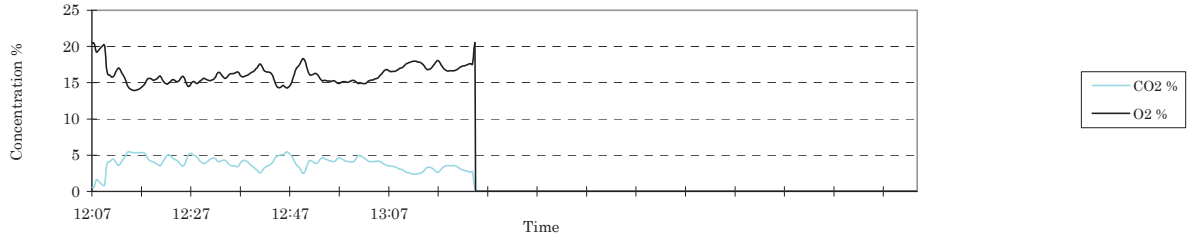
Date:	2012/1/15
Place:	No.10 school
HOB type:	MWB-1
Boiler Capacity (kW):	1.00
Cross sectional area of duct (m2):	0.502
Type of Coal:	Nalaikh (crushed)

Comment:

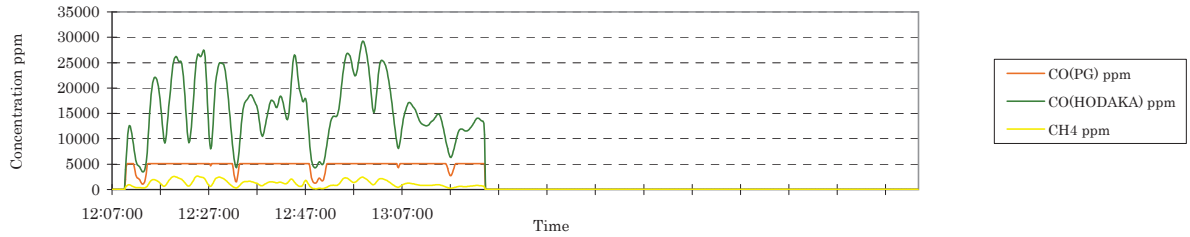
NOX,SO2,CO(Horiba),T



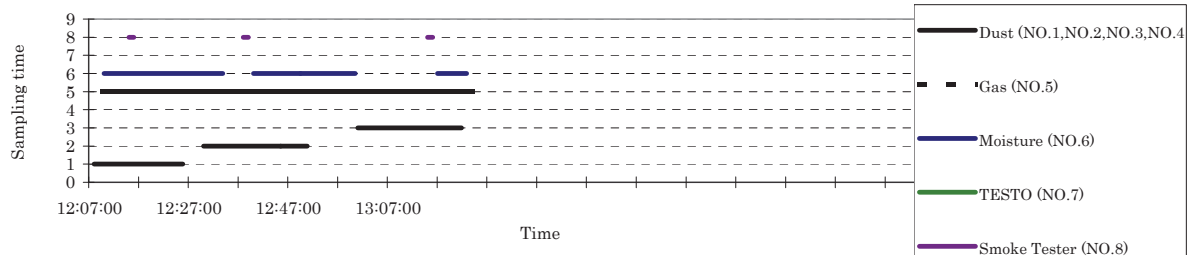
CO2,O2



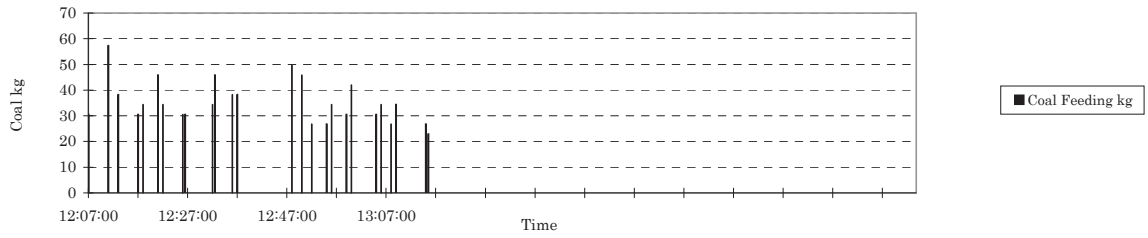
CO(PG-250),CO(HODAKA)



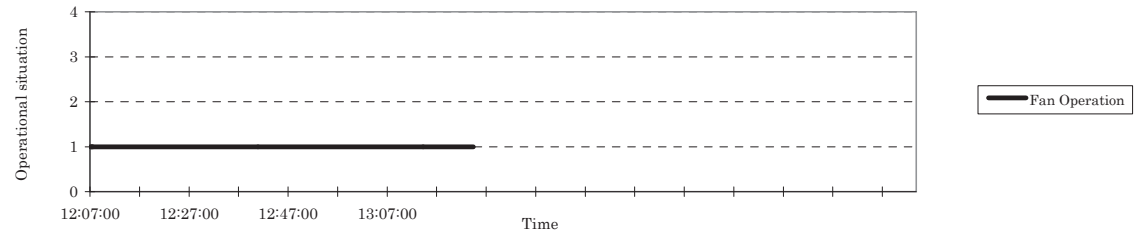
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



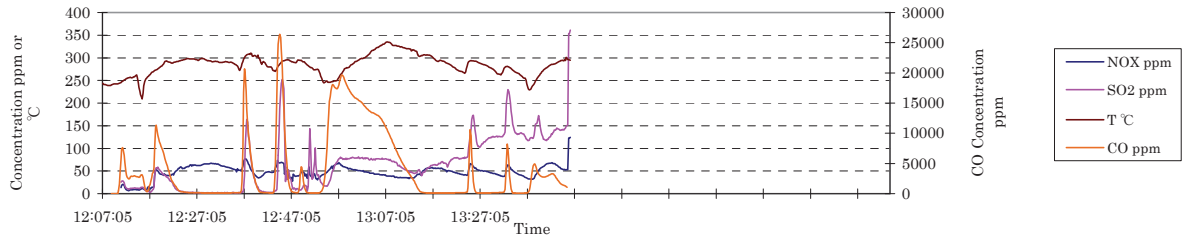
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

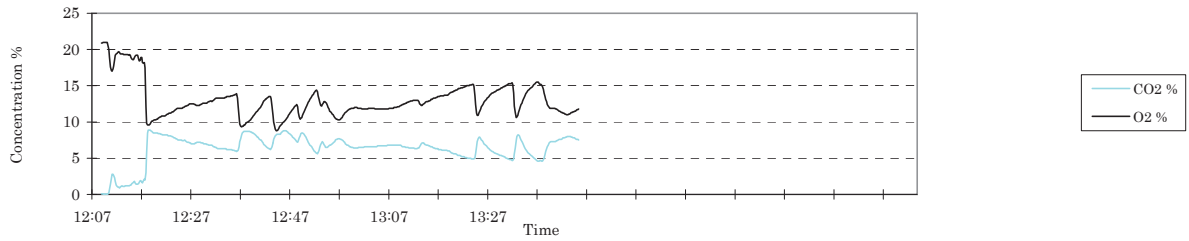
Date:	2012/1/17
Place:	BELON LLC
HOB type:	HP18-27
Boiler Capacity (kW):	0.00
Cross sectional area of duct (m2):	0.042
Type of Coal:	Nalaikh

Comment:

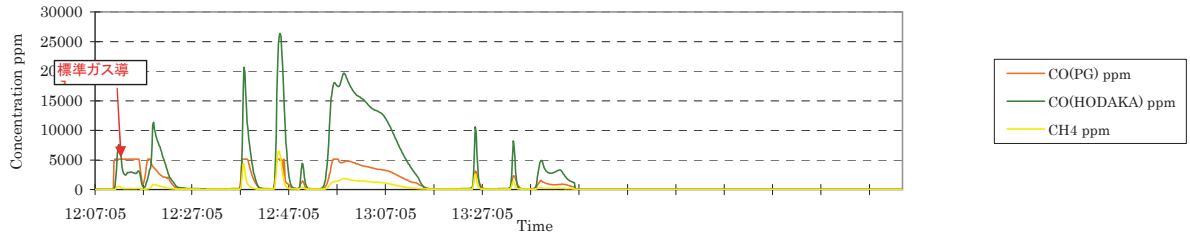
NOX,SO2,CO(Horiba),T



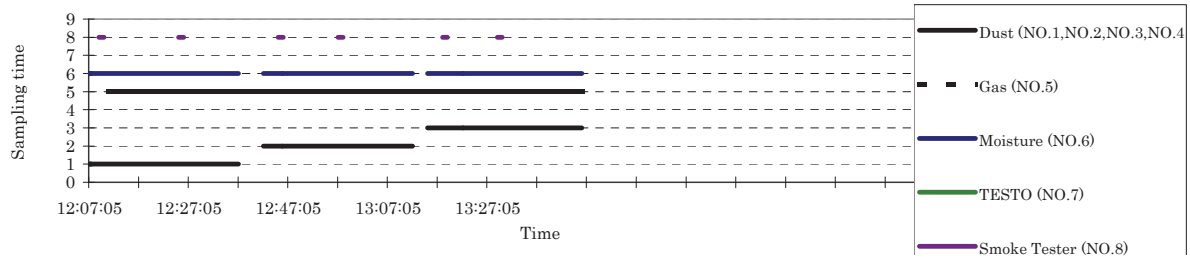
CO2,O2



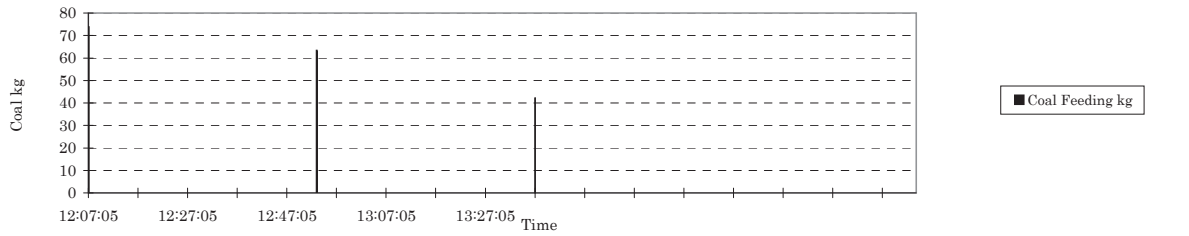
CO(PG-250),CO(HODAKA)



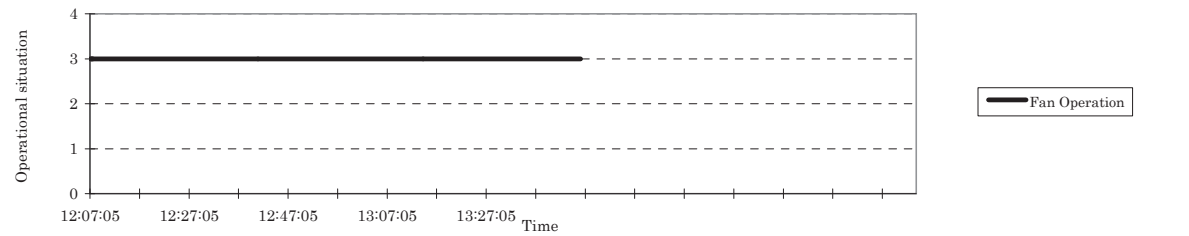
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

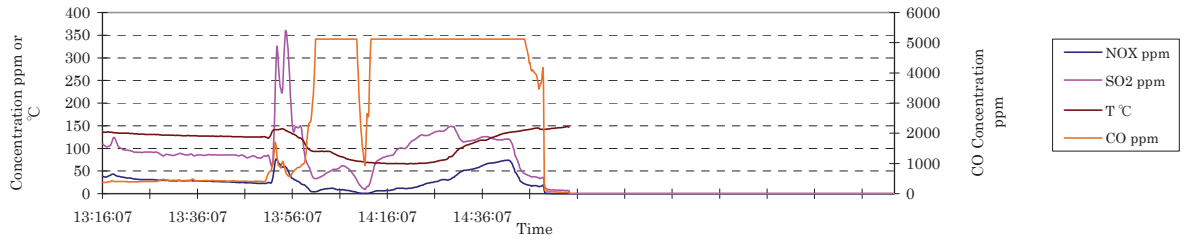
Graph of Measurement Result

Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тооc, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

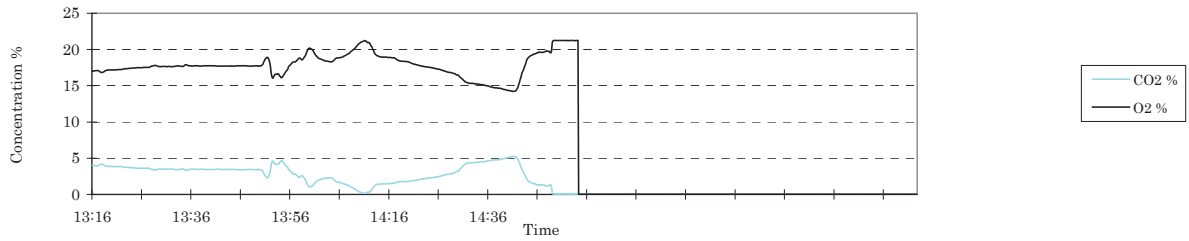
Date:	2012/1/19
Place:	No.17 Secondary Schoo
HOB type:	Viaduras VSB IV
Boiler Capacity (kW):	0.39
Cross sectional area of duct (m2):	0.129
Type of Coal:	Baganuur

Comment:

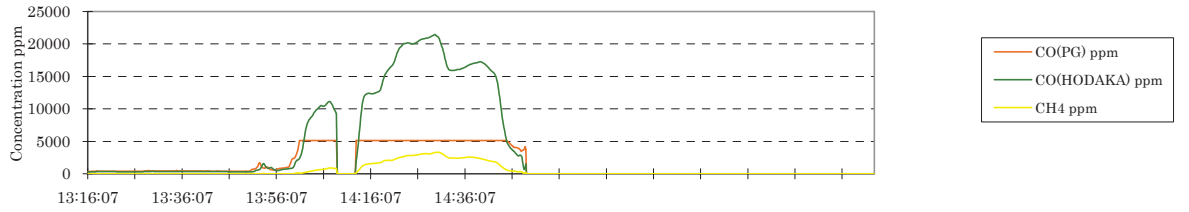
NOX,SO2,CO(Horiba),T



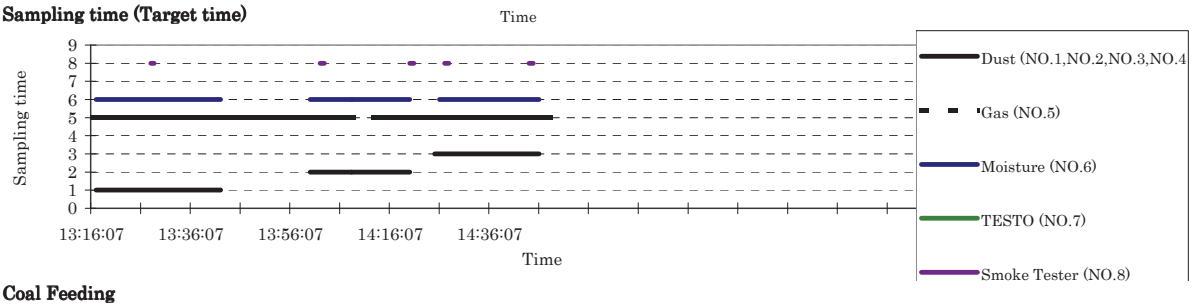
CO2,O2



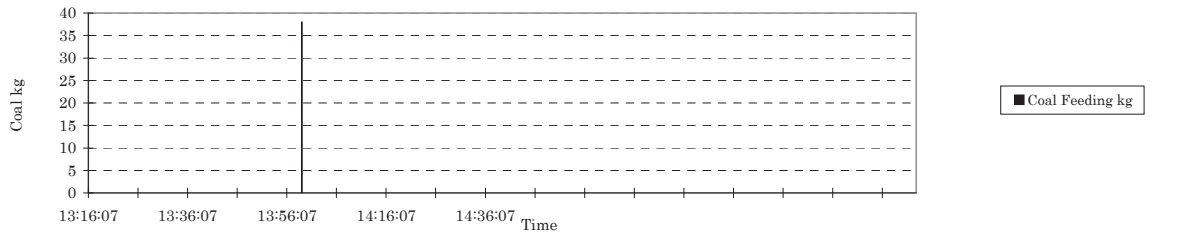
CO(PG-250),CO(HODAKA)



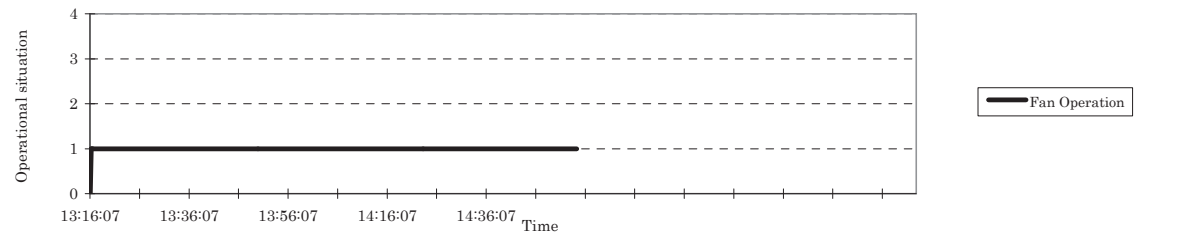
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

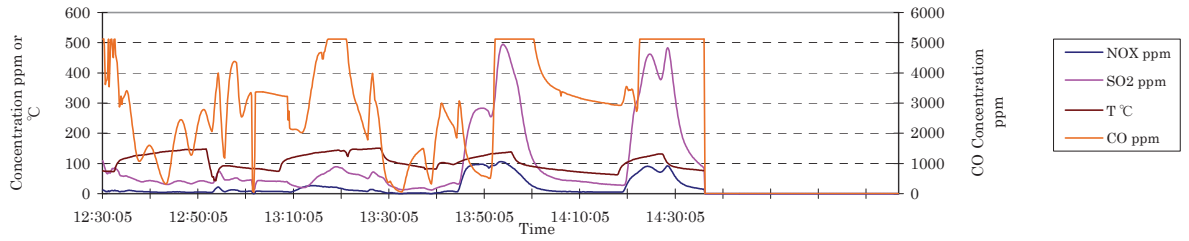
Graph of Measurement Result

Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тоос, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

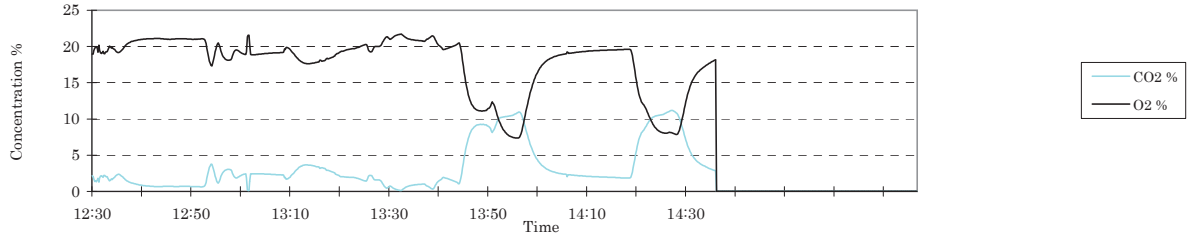
Date:	2012/1/20
Place:	No.58 Secondary Schoo
HOB type:	MUHT
Boiler Capacity (kW):	0.70
Cross sectional area of duct (m2):	0.196
Type of Coal:	Nalaikh

Comment:

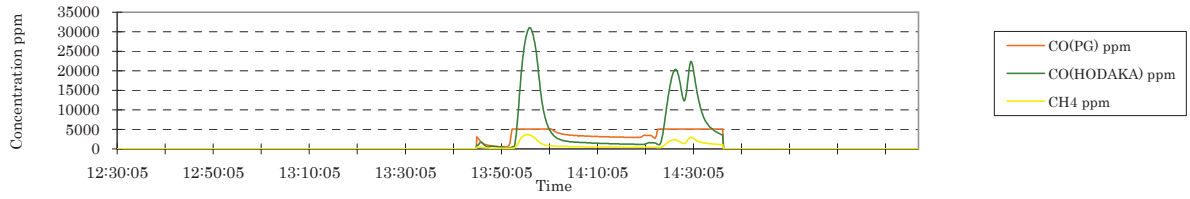
NOX,SO2,CO(Horiba),T



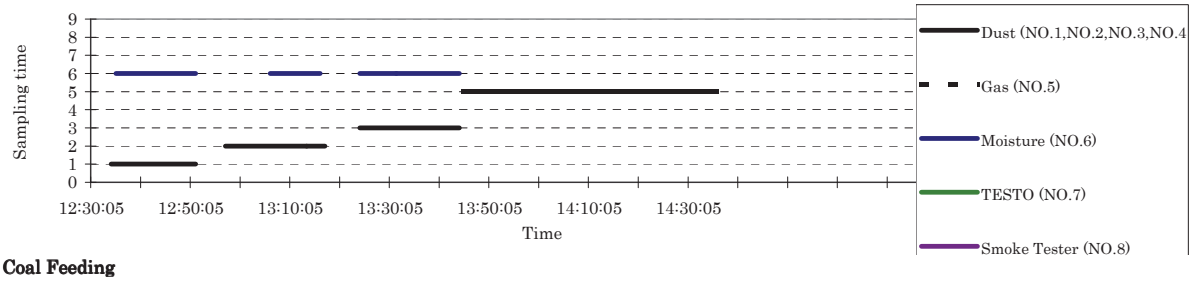
CO2,O2



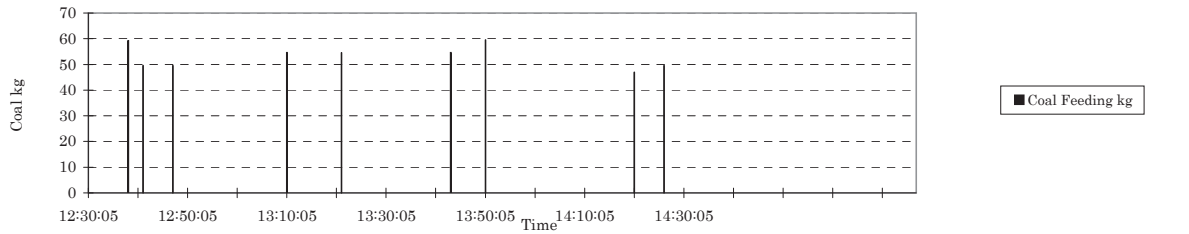
CO(PG-250),CO(HODAKA)



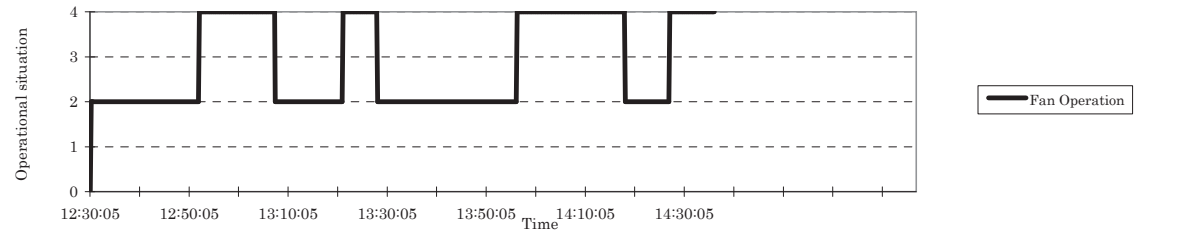
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

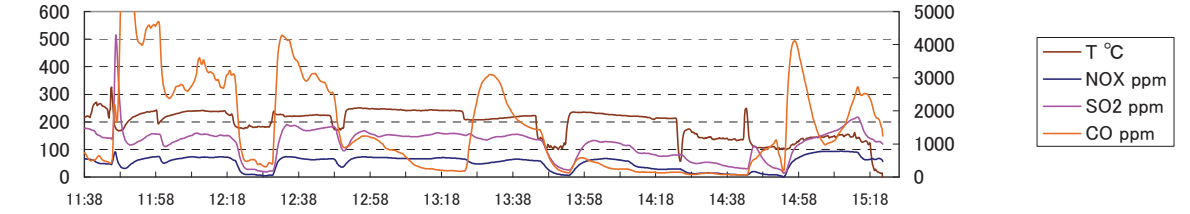
Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тооc, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

Date:	2012/1/22
Place:	NO.59 school
HOB type:	Mon dulaan
Boiler Capacity (kW):	0.06
Cross sectional area of duct (m2):	0.013
Type of Coal:	Nalaikh (lump)

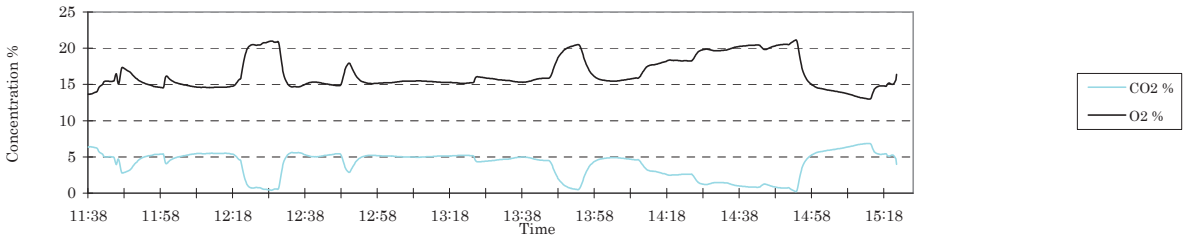
Comment:

11:46-д нүүрс цэнэглэсний дараа тоосны дээжийг авсан боловч багажтай холбогдох хэсгийн шугам хоолойн холболт таруу хийгдснээс болж хэмжилт бүтэлгүйтсэн. Дараагийн нүүрс цэнэглэлт нь 3 цагийн дараа буюу 13:44. Багажны холболтыг засч тоосны 1-р дээжийг 13:55-с 30 минутын хугацаатайгаар дээжилсэн. 2-р дээжийг нийтдээ 1 цагийн турш дээжилж авсан. Энэ удаад 2 ширхэг тоосны дээжээр хэмжилтийг дуусгасан. Зуухны галч нь бидний хүсэн хугацаанаас өмнө галын хотлыг шилээгүүрдэж, нүүрс цэнэглэлт зэргийг хийж байсан учраас тоосны 3 дахь дээжийг үгсарч бэлдсэн ч нүүрс цэнэглэлтийн дараах агшины тоосны дээжийг авч чадахааргүй байсан болохоор юм. Утааны хийн найрлаганы хувьд 14:44-н нүүрс цэнэглэлтээс хойш тунадас баригчийн оролтын хоолой хөлдөөс болж хэвийн соруулах боломжгүй болсон. Тиймээс тухайн хугацаанд хийгдсэн утааны хийн агууламжийг дундаж утга боловсруулах тооцоололд ашиглаагүй болно. (Хүчил төрөгчийн агууламж 19,20% орчим байсан)

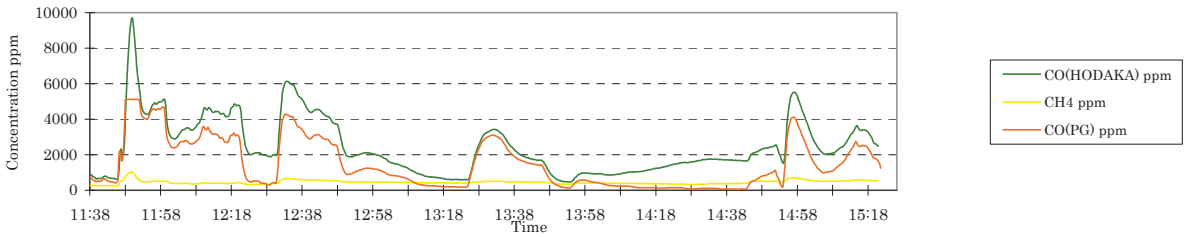
NOX,SO2,CO(Horiba),T



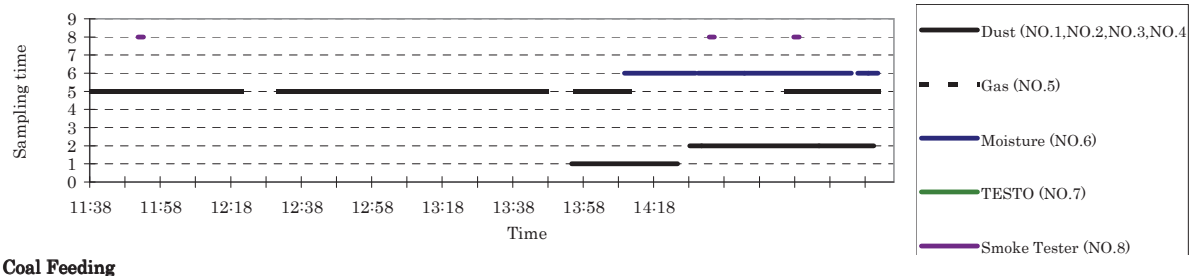
CO2,O2



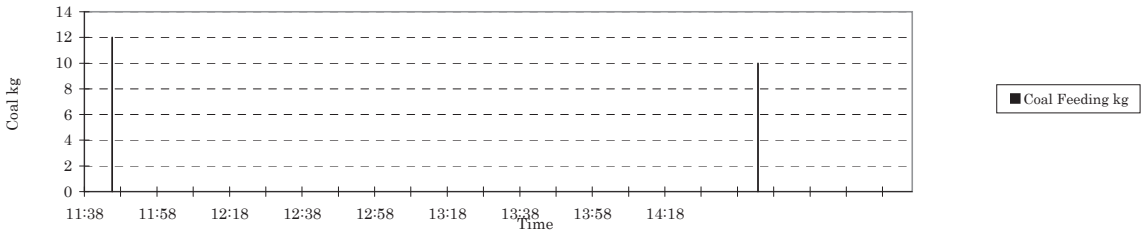
CO(PG-250),CO(HODAKA)



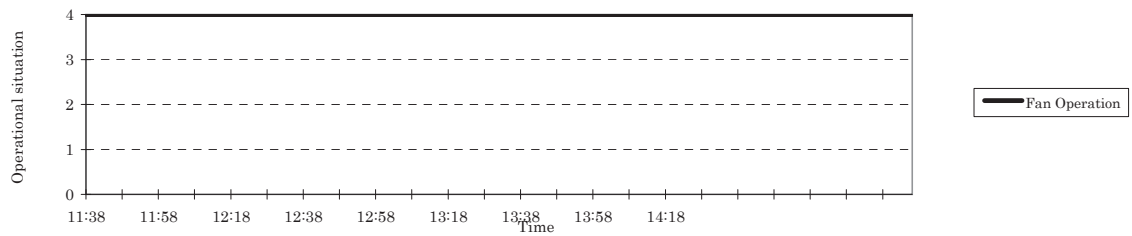
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

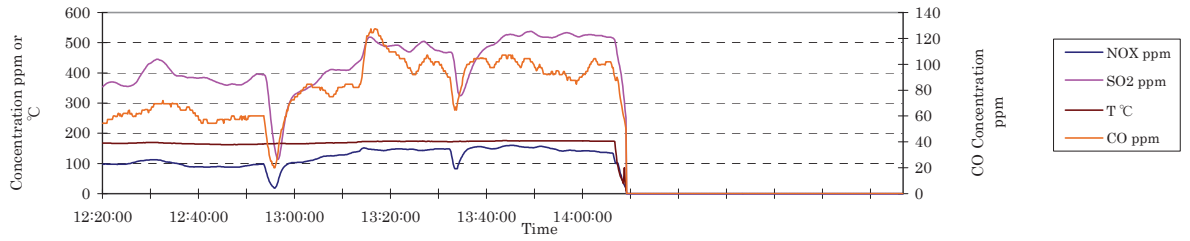
Graph of Measurement Result

Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тооc, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

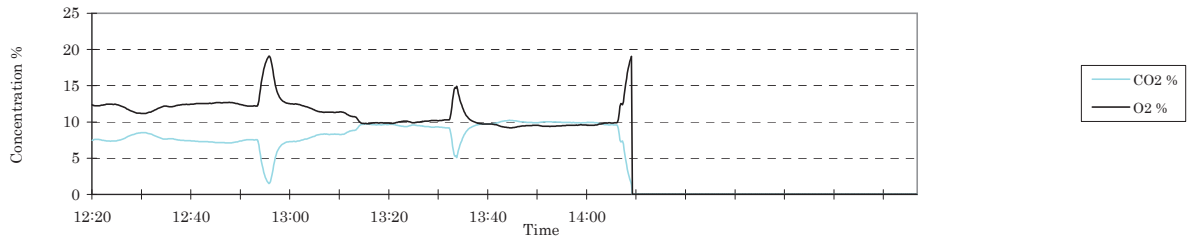
Date:	2012/1/31
Place:	Police Academy
HOB type:	DZL 2.8
Boiler Capacity (kW):	2.80
Cross sectional area of duct (m2):	0.181
Type of Coal:	Nalaikh

Comment:

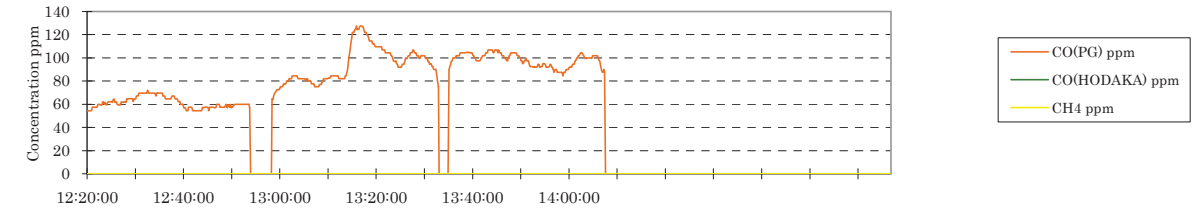
NOX,SO2,CO(Horiba),T



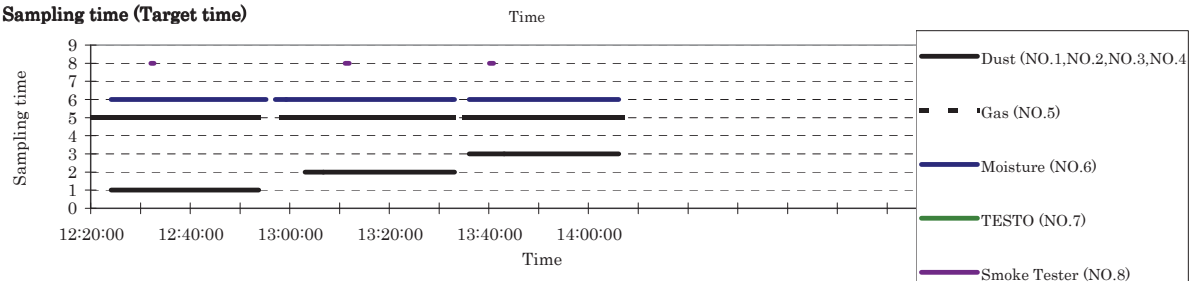
CO2,O2



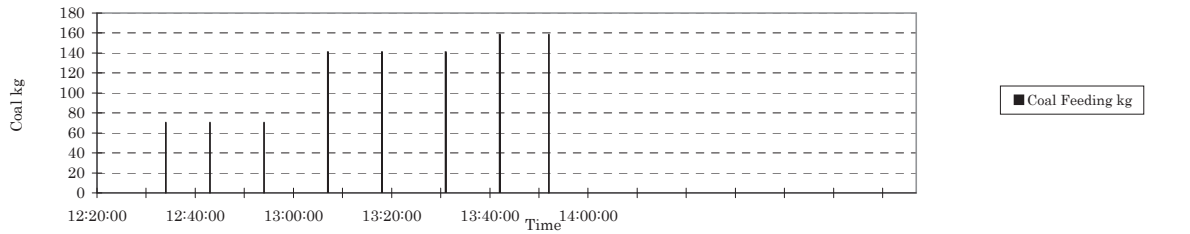
CO(PG-250),CO(HODAKA)



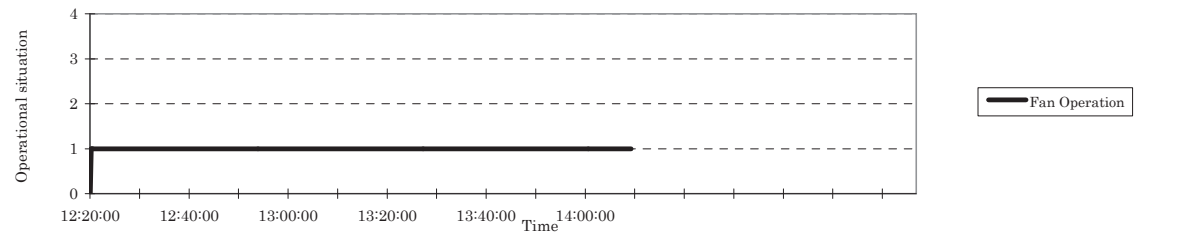
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



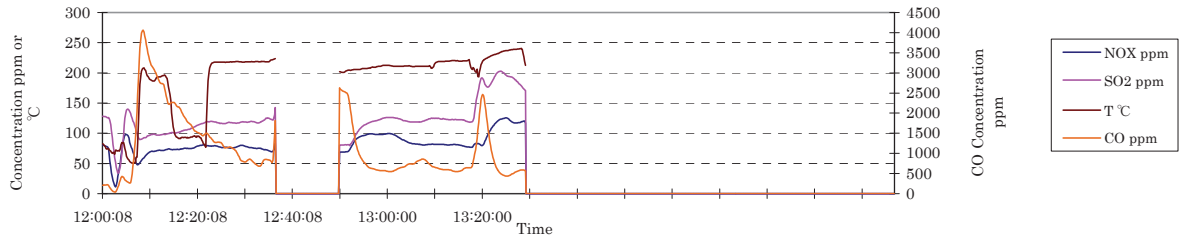
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

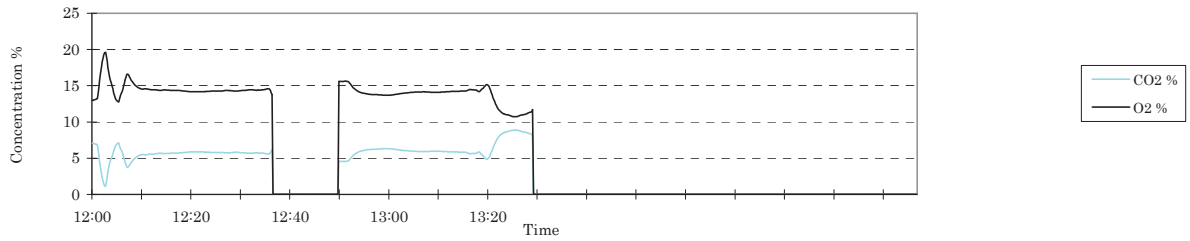
Date:	2012/2/1
Place:	No. 71 School
HOB type:	Dliirsh 170-88/55
Boiler Capacity (kW):	0.17
Cross sectional area of duct (m2):	0.152
Type of Coal:	Buganuur

Comment:

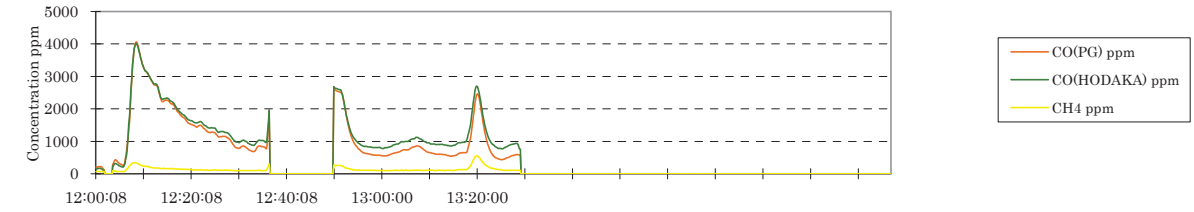
NOX,SO2,CO(Horiba),T



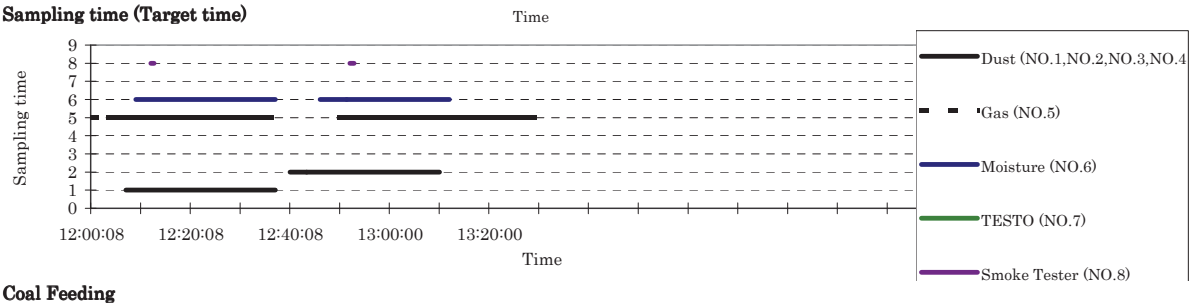
CO2,O2



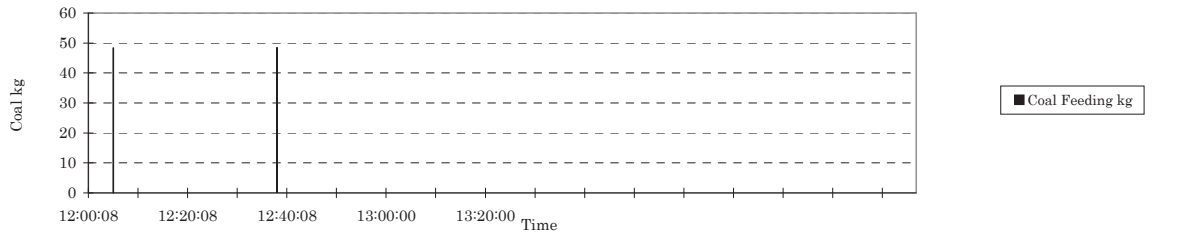
CO(PG-250),CO(HODAKA)



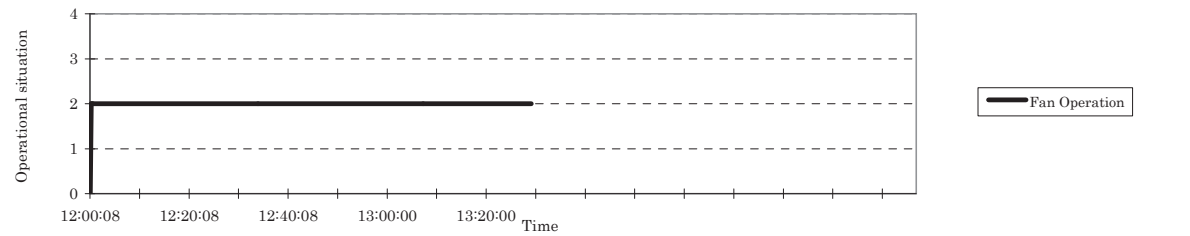
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



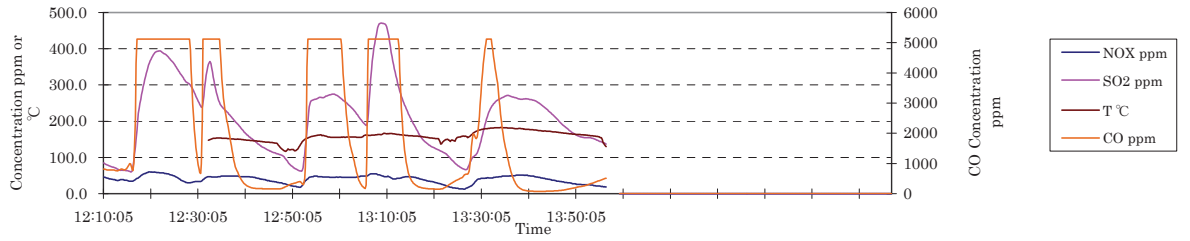
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

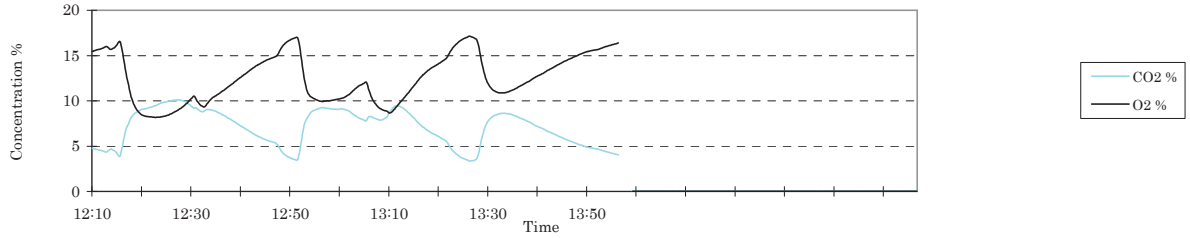
Date:	2012/2/3
Place:	N0.104 School
HOB type:	WWSG 0.35
Boiler Capacity (kW):	0.35
Cross sectional area of duct (m2):	0.068
Type of Coal:	Nalaikh

Comment:

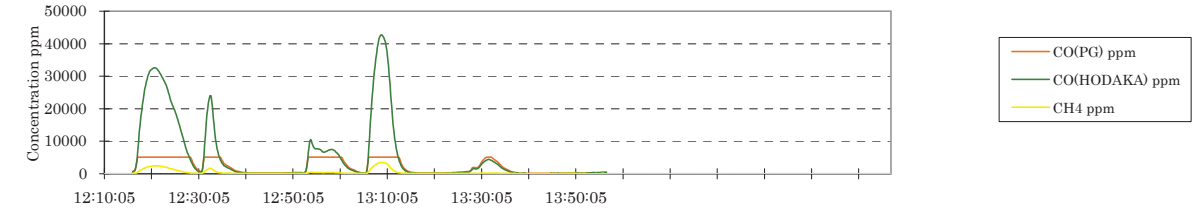
NOX,SO2,CO(Horiba),T



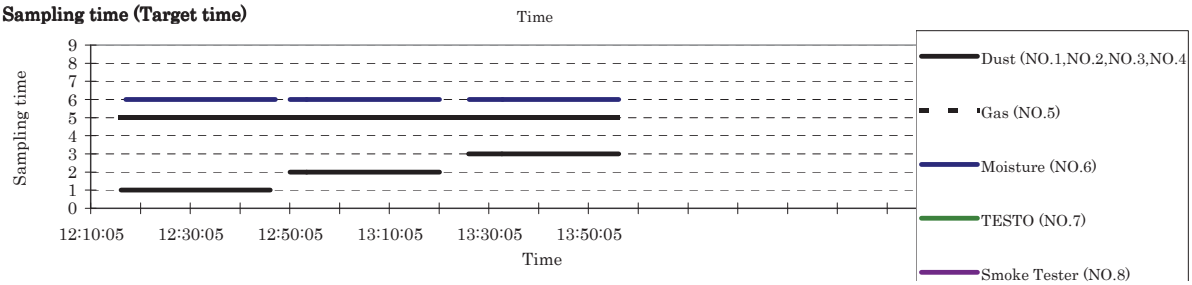
CO2,O2



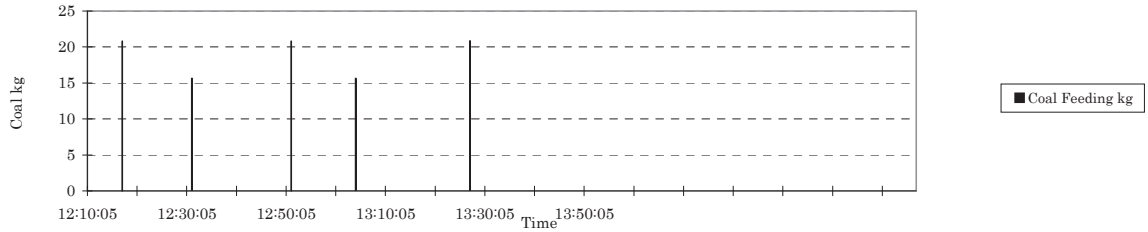
CO(PG-250),CO(HODAKA)



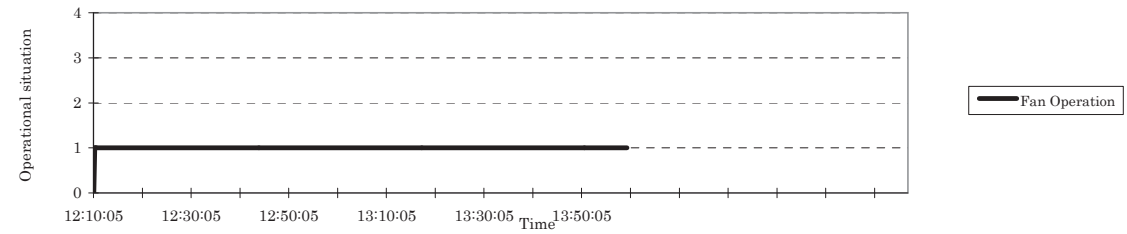
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



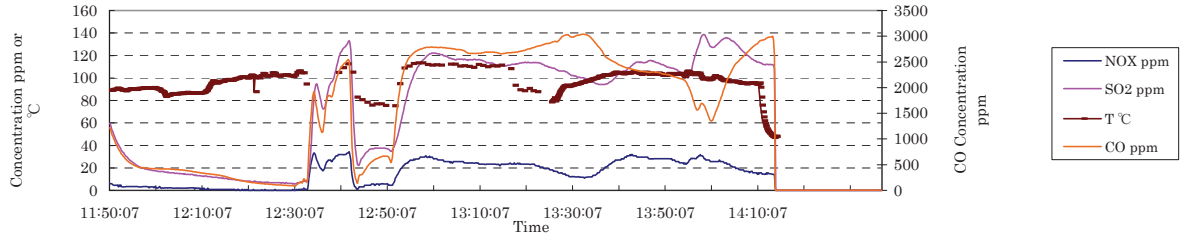
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

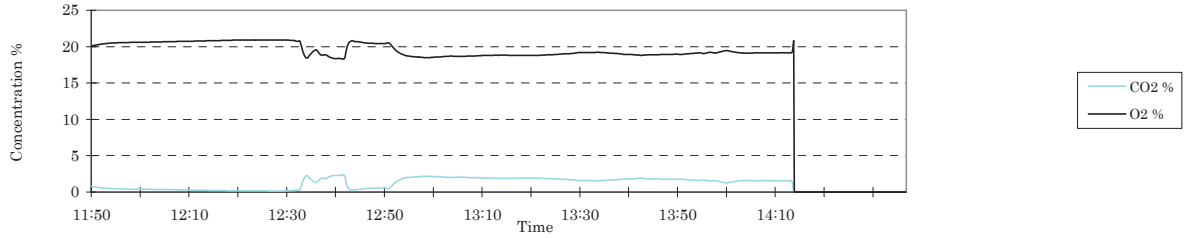
Date:	2012/2/5
Place:	Mr. Davaajargal Hom
HOB type:	Wall stove
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.053
Type of Coal:	Nalaikh

Comment:

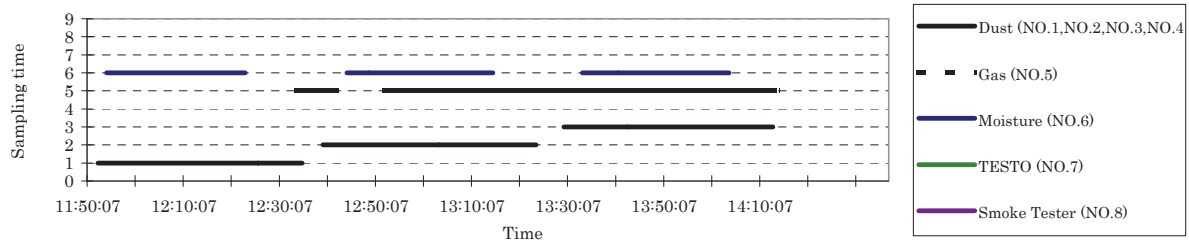
NOX,SO2,CO(Horiba),T



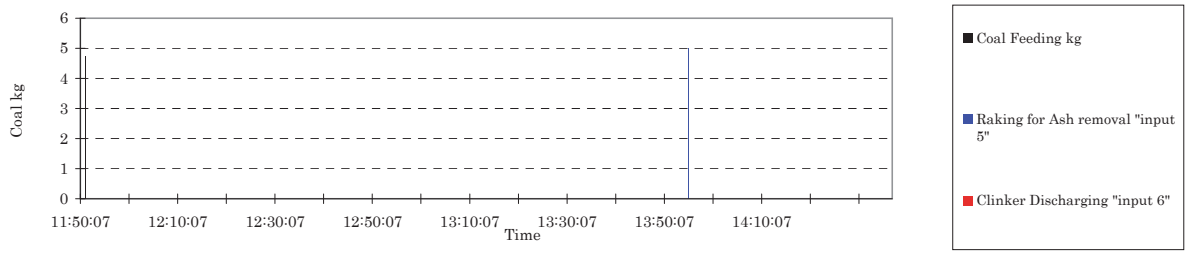
CO2,O2



Sampling time (Target time)

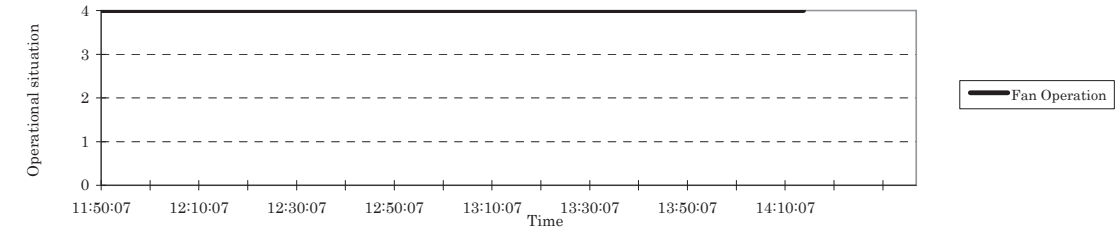


Coal Feeding 、Raking、Clinker Discharging



Blue: Scratching for Ash removal (constant value"5") Red: Clinker Discharging (constant value"6")

HOB Fan Operational Situation



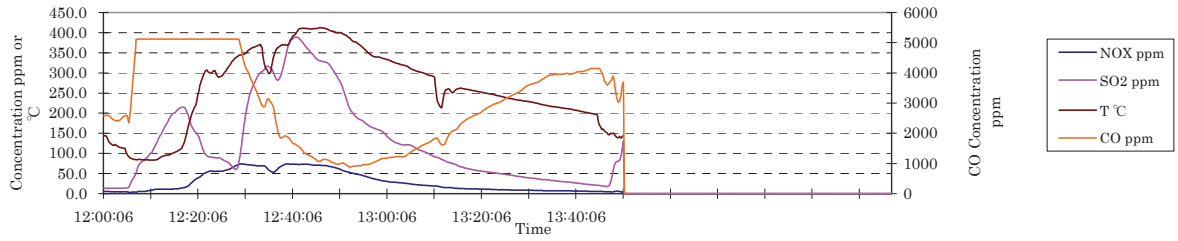
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

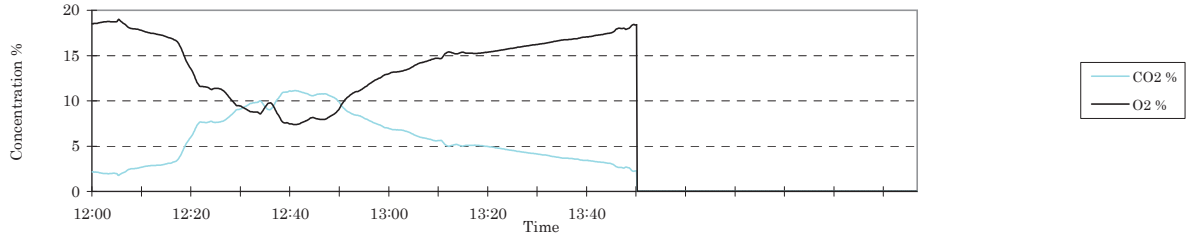
Date:	2012/2/6
Place:	Ger of Mr. Davaajarga
HOB type:	Ger stove(Coal)
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.008
Type of Coal:	Nalaikh

Comment:

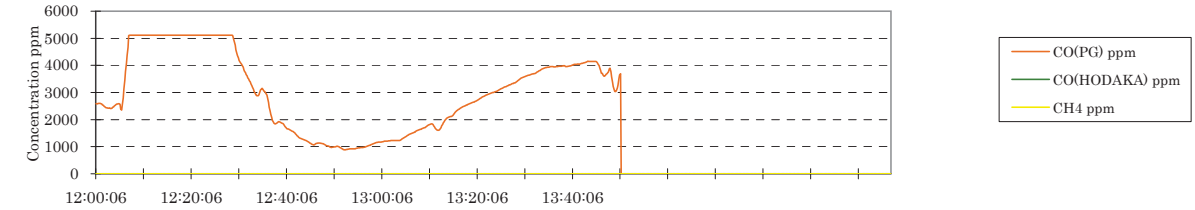
NOX,SO2,CO(Horiba),T



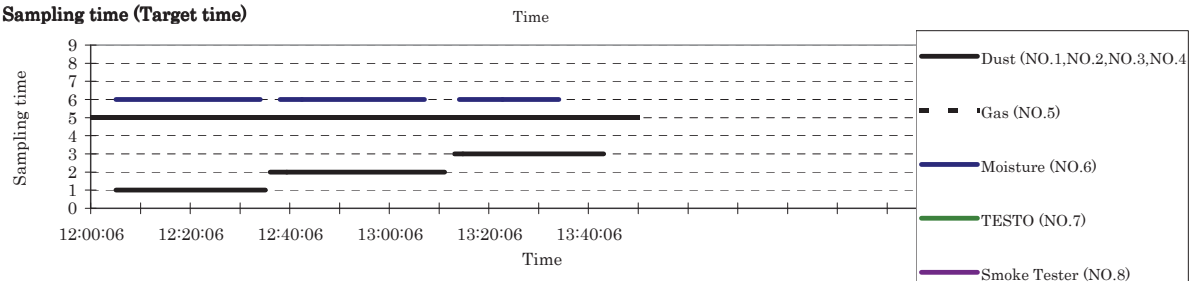
CO2,O2



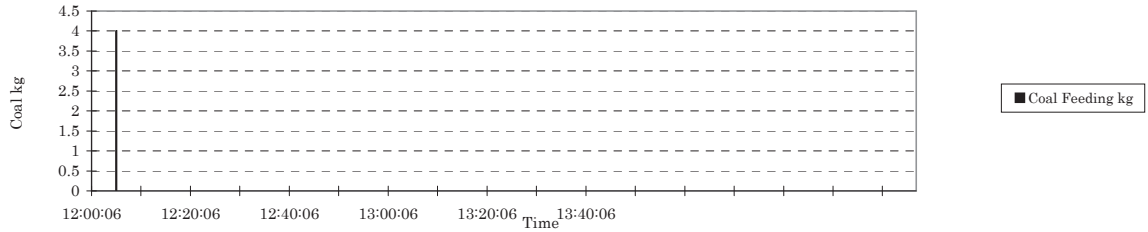
CO(PG-250),CO(HODAKA)



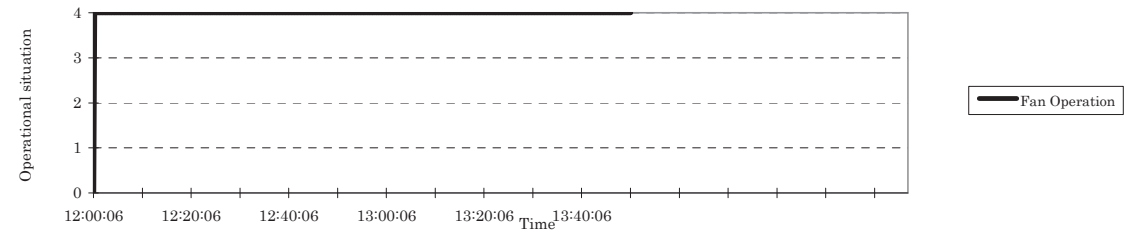
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



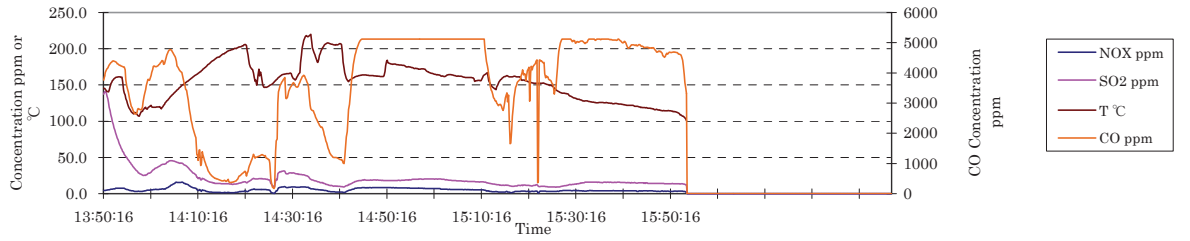
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

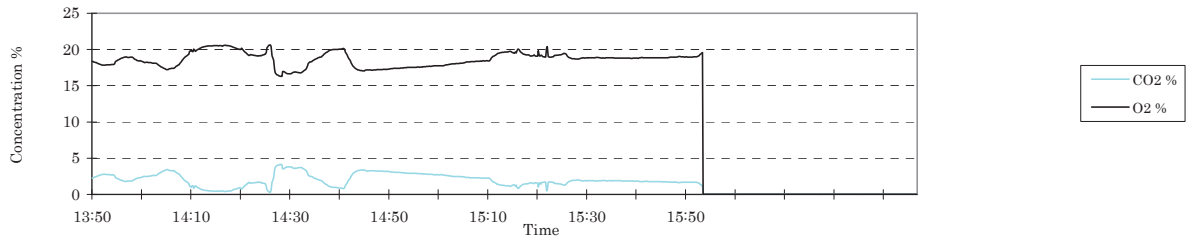
Date:	2012/2/6
Place:	Davaajargal
HOB type:	Gel stove (Semi-Coke)
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.0079
Type of Coal:	Semi-Coke

Comment:

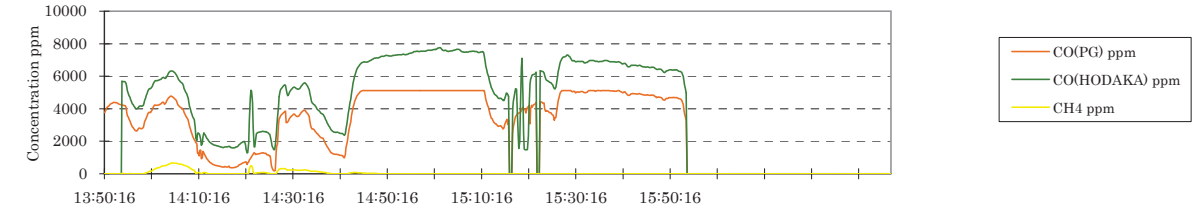
NOX,SO2,CO(Horiba),T



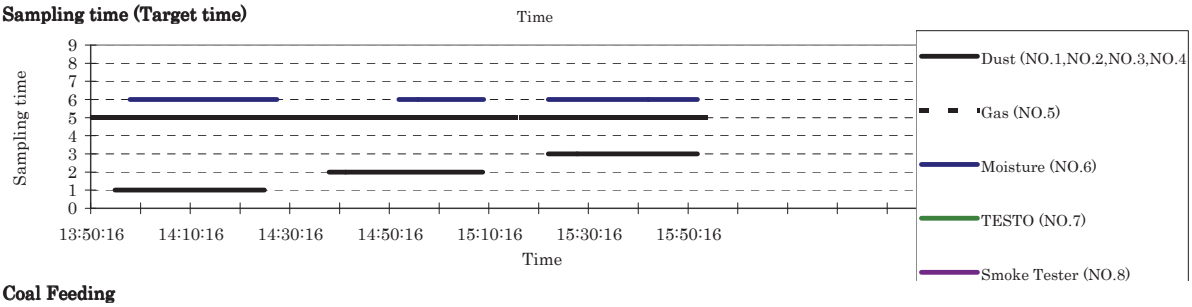
CO2,O2



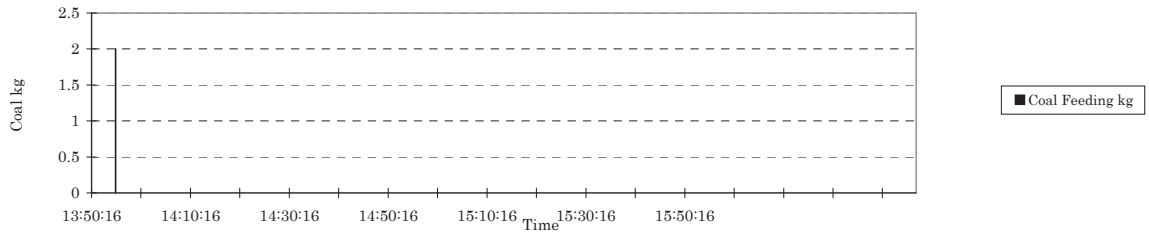
CO(PG-250),CO(HODAKA)



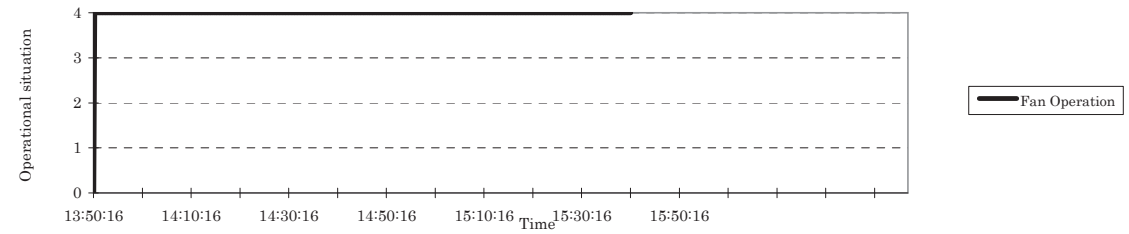
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



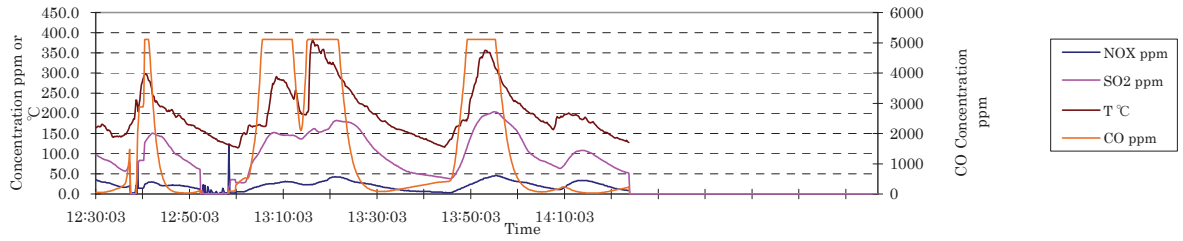
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

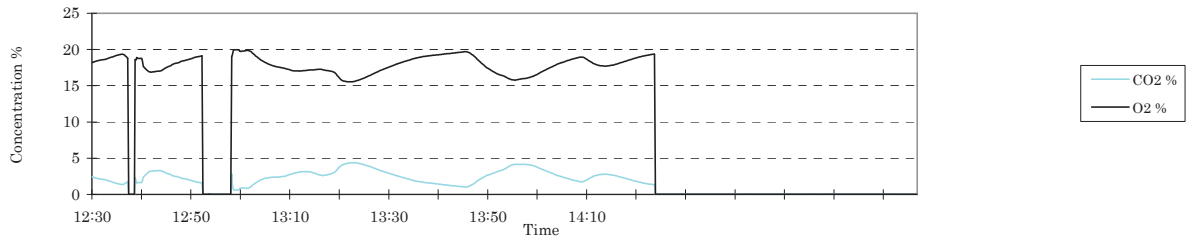
Date:	2012/2/9
Place:	Ecology Institute
HOB type:	unknown
Boiler Capacity (kW):	unknown
Cross sectional area of duct (m2):	0.138
Type of Coal:	Nalaikh

Comment:

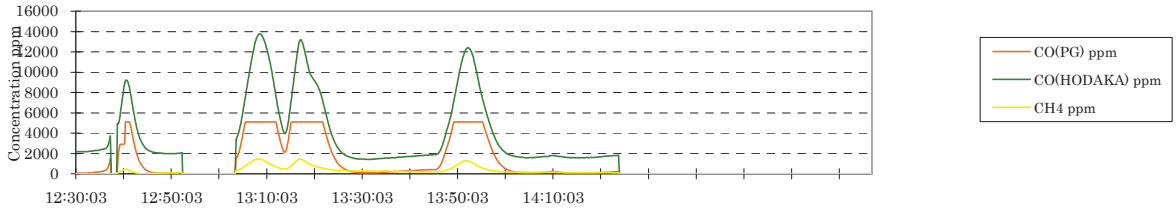
NOX,SO2,CO(Horiba),T



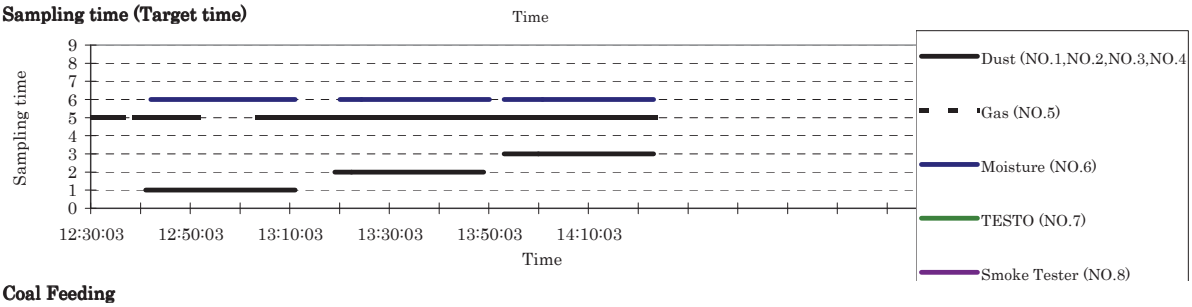
CO2,O2



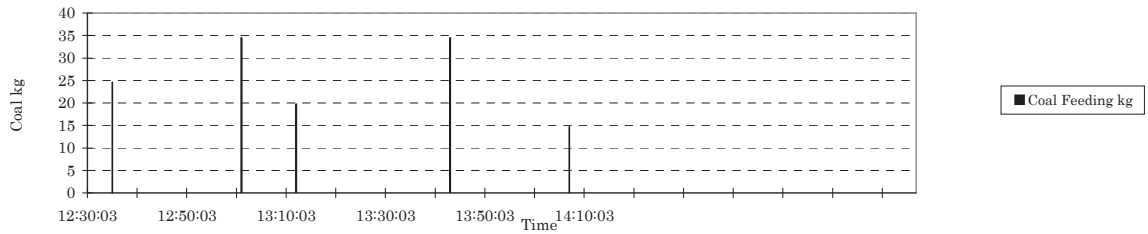
CO(PG-250),CO(HODAKA)



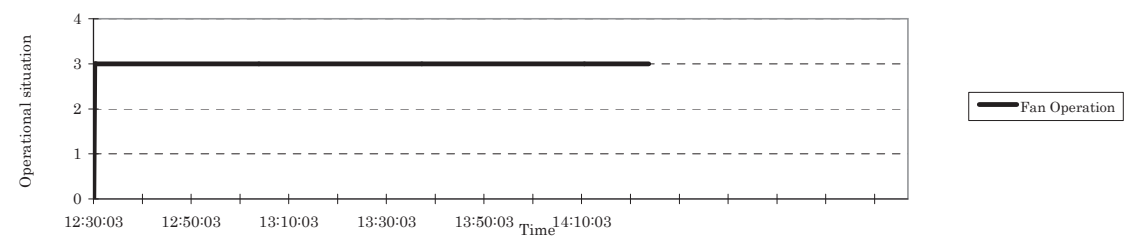
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

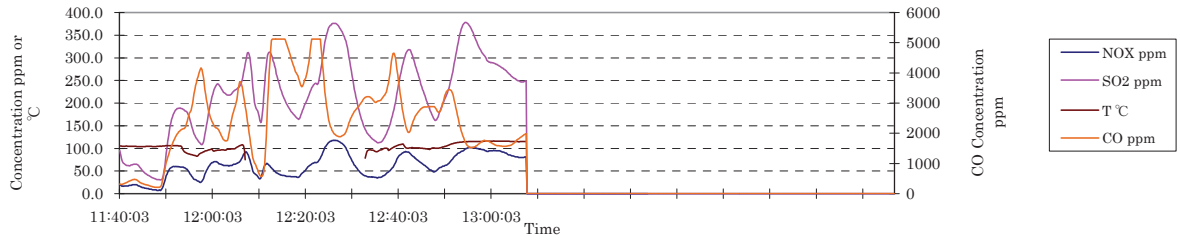
Graph of Measurement Result

Date:	2012/2/10
Place:	No.118 School
HOB type:	Carborobot 300
Boiler Capacity (kW):	0.30
Cross sectional area of duct (m2):	0.025
Type of Coal:	Nalaikh

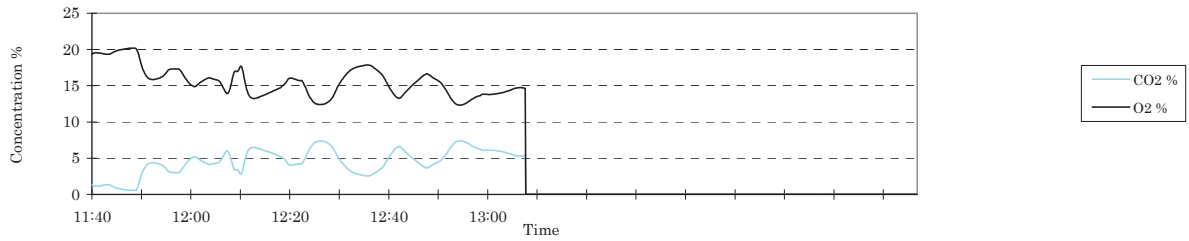
Comment:

Автомат ул ширэмтэй Carborobot зуух. Нүүрсний бункерээс галын хотол руу бага багаар нүүрс түгээгддэг учраас нүүрс цэнэглэлтийн хугацааг бичиж тэмдэглэх боломжгүй.

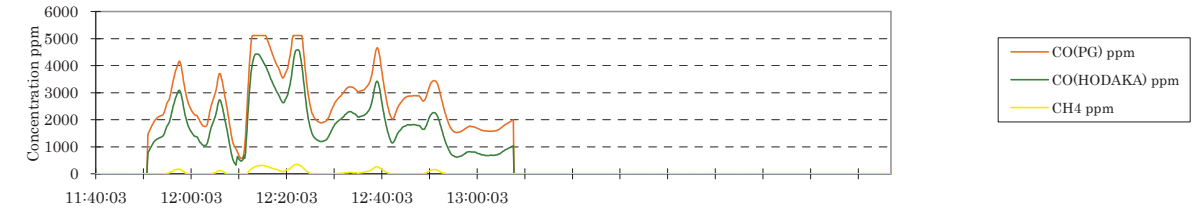
NOX,SO2,CO(Horiba),T



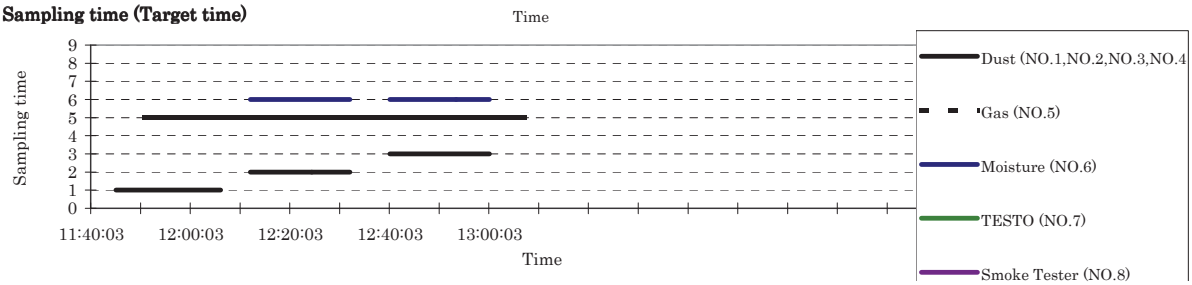
CO2,O2



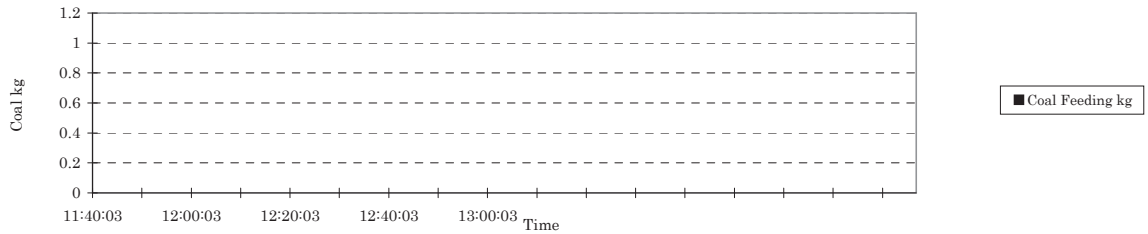
CO(PG-250),CO(HODAKA)



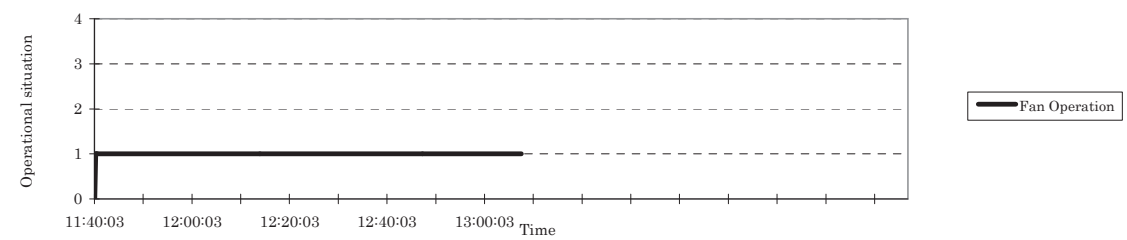
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



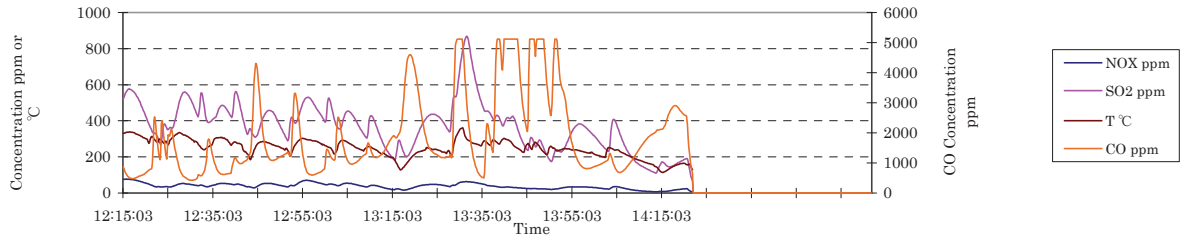
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

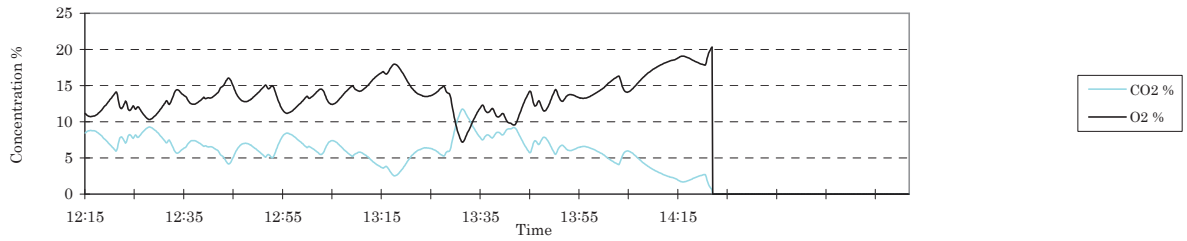
Date:	2012/2/13
Place:	No.102 school
HOB type:	HP18-27
Boiler Capacity (kW):	0.73 ?
Cross sectional area of duct (m2):	0.053
Type of Coal:	Nalaikh

Comment:

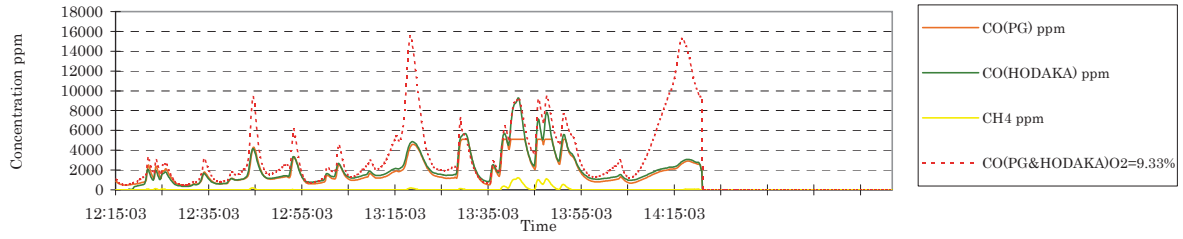
NOX,SO2,CO(Horiba),T



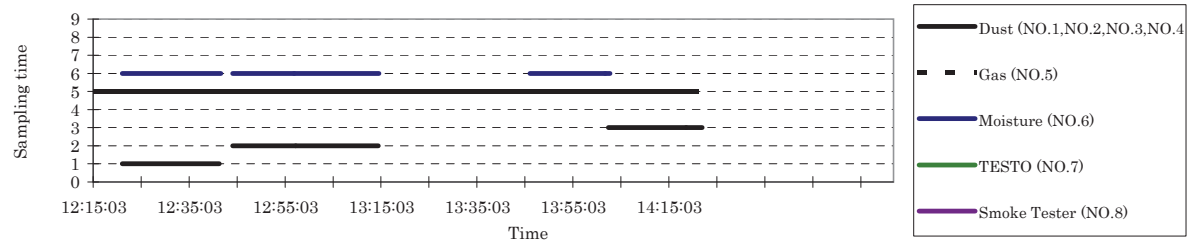
CO2,O2



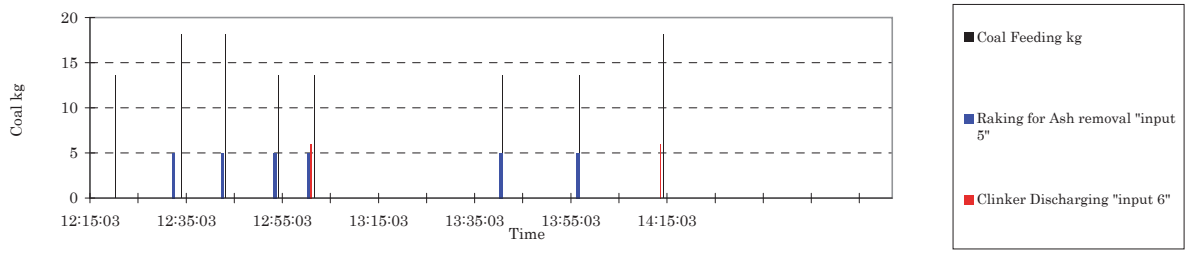
CO(PG-250),CO(HODAKA)



Sampling time (Target time)

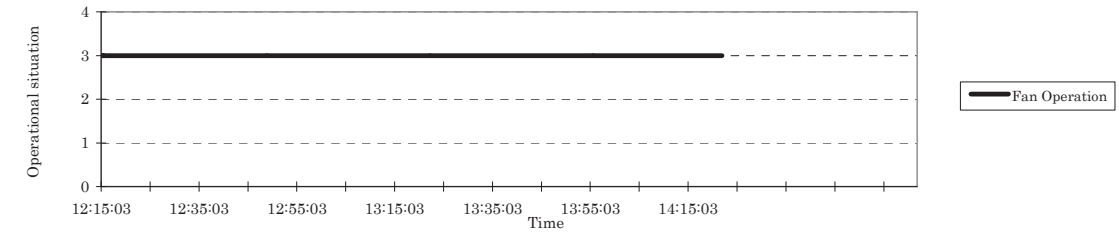


Coal Feeding 、Raking、Clinker Discharging



Blue: Scratching for Ash removal (constant value"5") Red: Clinker Discharging (constant value"6")

HOB Fan Operational Situation



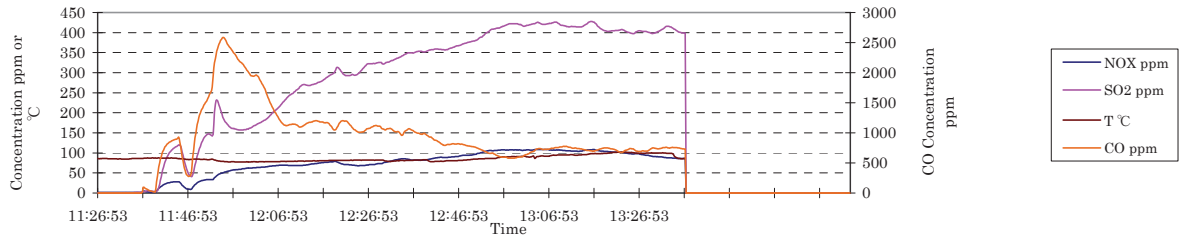
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

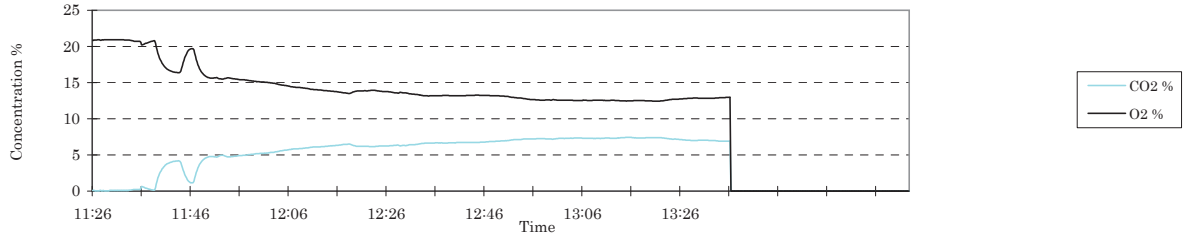
Date:	2012/2/14
Place:	No.63 school
HOB type:	BNEB
Boiler Capacity (kW):	0.23
Cross sectional area of duct (m2):	0.031
Type of Coal:	Nalaikh

Comment:

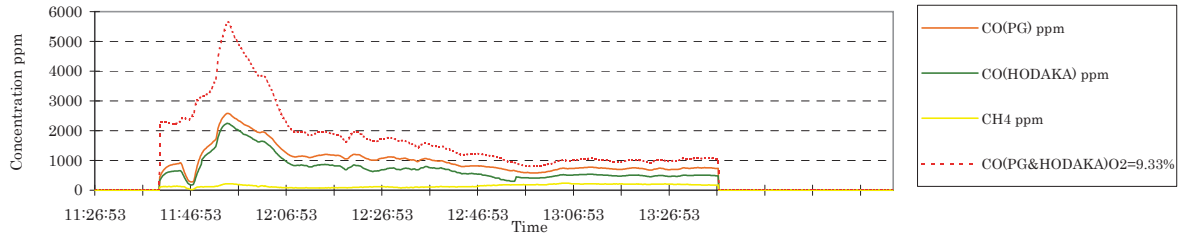
NOX,SO2,CO(Horiba),T



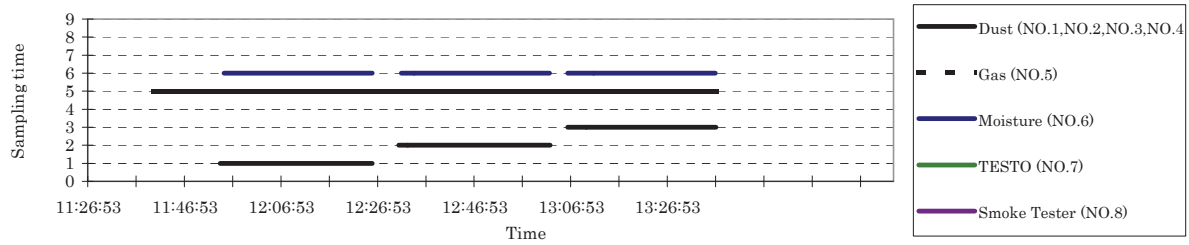
CO2,O2



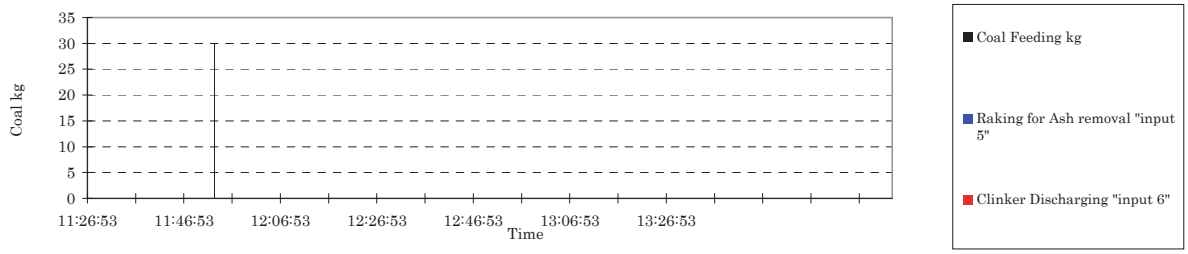
CO(PG-250),CO(HODAKA)



Sampling time (Target time)

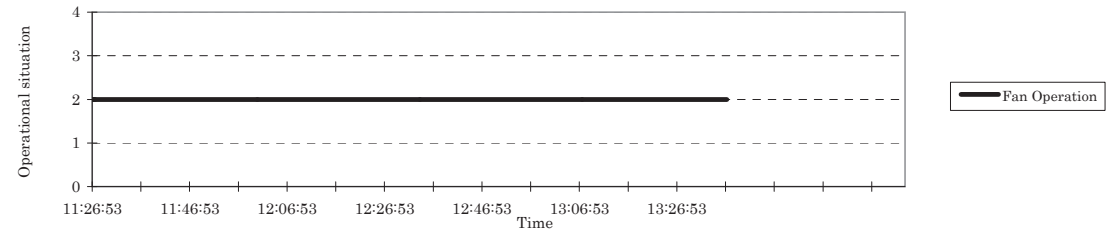


Coal Feeding 、Raking 、Clinker Discharging



Blue: Scratching for Ash removal (constant value"5") Red: Clinker Discharging (constant value"6")

HOB Fan Operational Situation



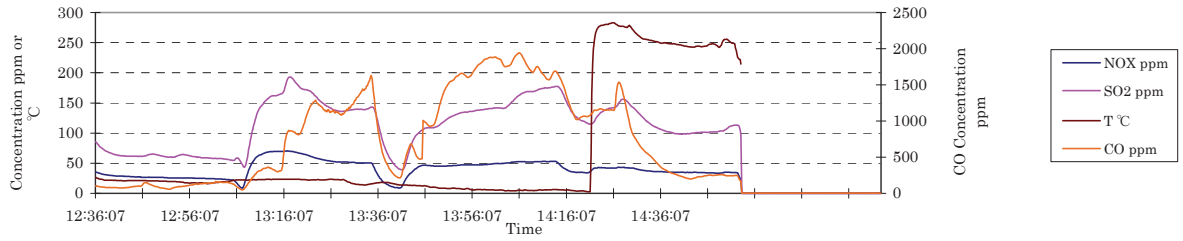
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

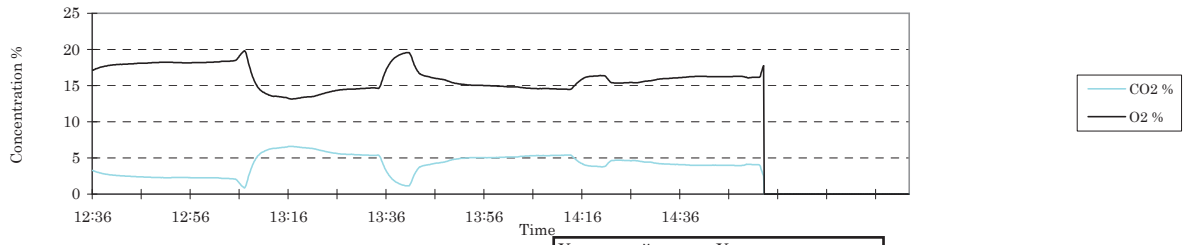
Date:	2012/2/15
Place:	No. 105 school
HOB type:	Viadurus
Boiler Capacity (kW):	0.39
Cross sectional area of duct (m2):	0.042
Type of Coal:	Baganuur

Comment:

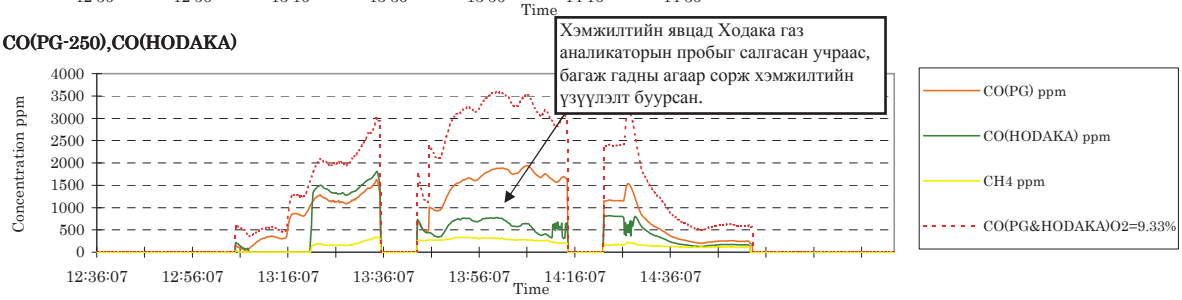
NOX,SO2,CO(Horiba),T



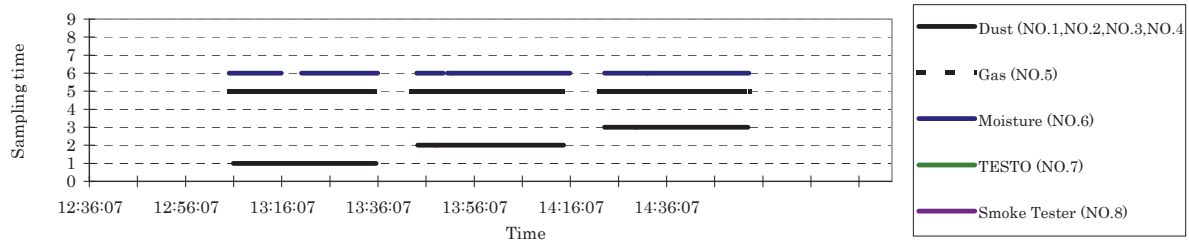
CO2,O2



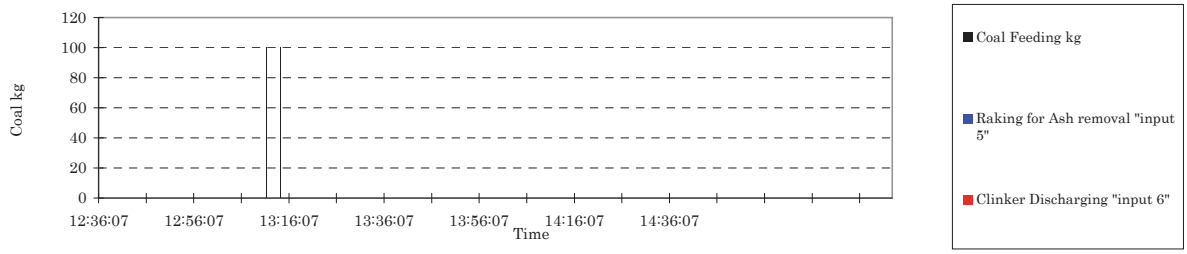
CO(PG-250),CO(HODAKA)



Sampling time (Target time)

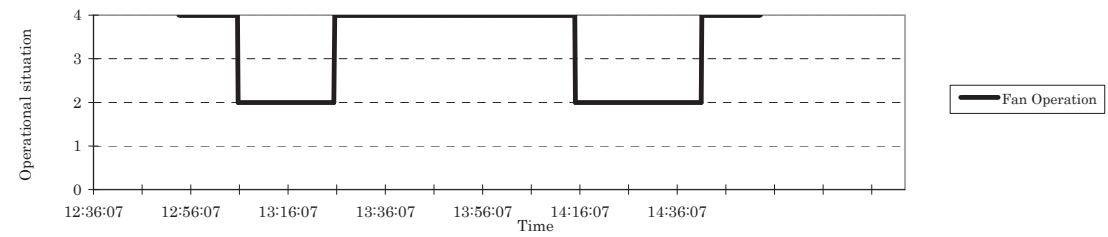


Coal Feeding 、Raking 、Clinker Discharging



Blue: Scratching for Ash removal (constant value"5") Red: Clinker Discharging (constant value"6")

HOB Fan Operational Situation



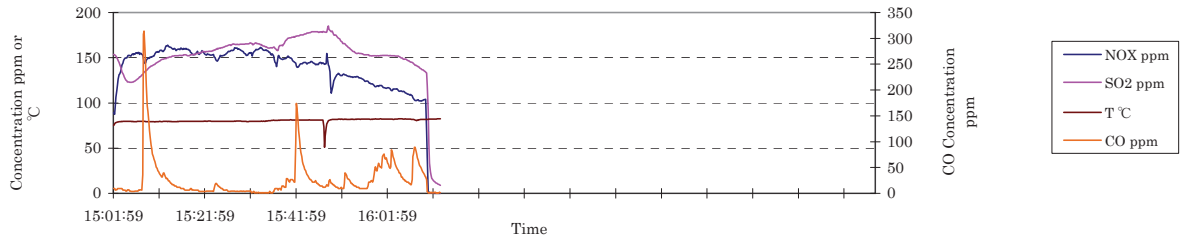
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

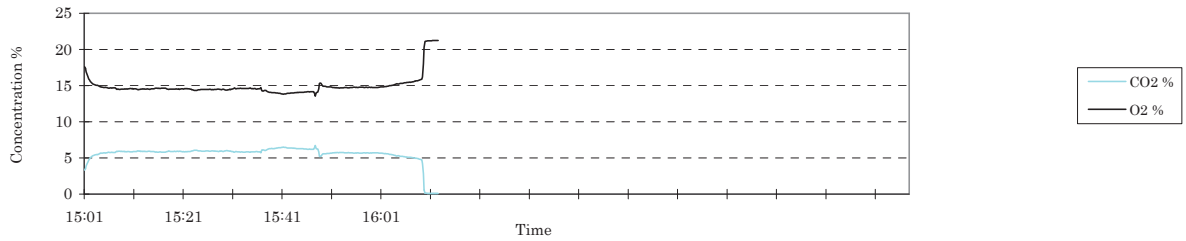
Date:	2012/1/24
Place:	No.3 Power Plant
HOB type:	No.7 Boiler Right duc
Boiler Capacity (kW):	220.00
Cross sectional area of duct (m2):	3.719
Type of Coal:	Buganuur

Comment:

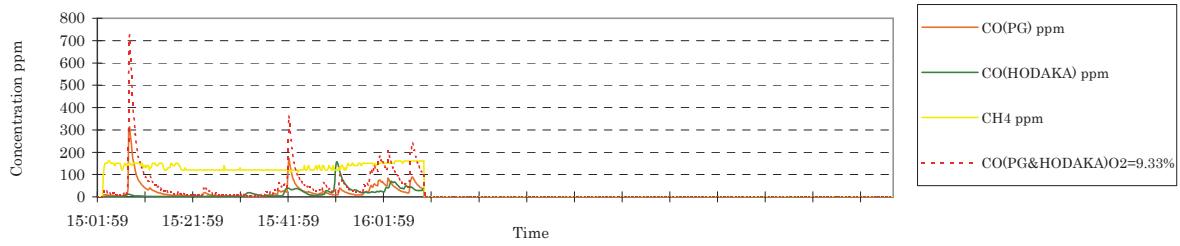
NOX,SO2,CO(Horiba),T



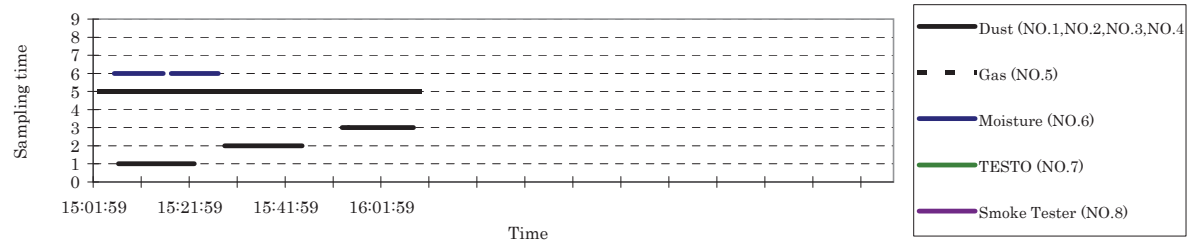
CO2,O2



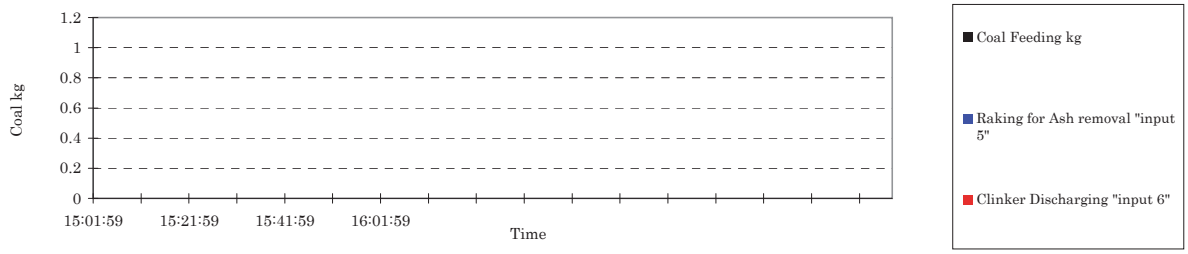
CO(PG-250),CO(HODAKA)



Sampling time (Target time)

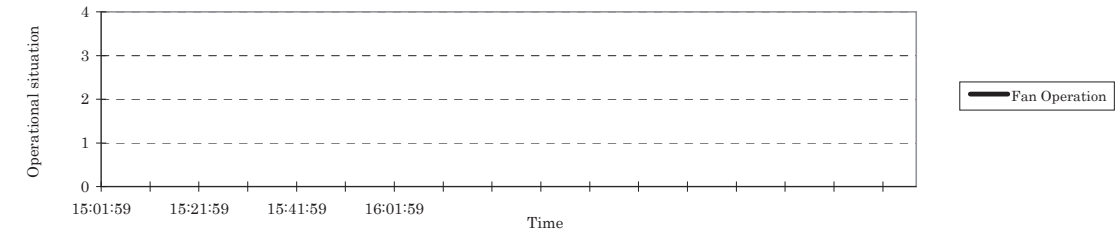


Coal Feeding 、Raking、Clinker Discharging



Blue: Scratching for Ash removal (constant value"5") Red: Clinker Discharging (constant value"6")

HOB Fan Operational Situation



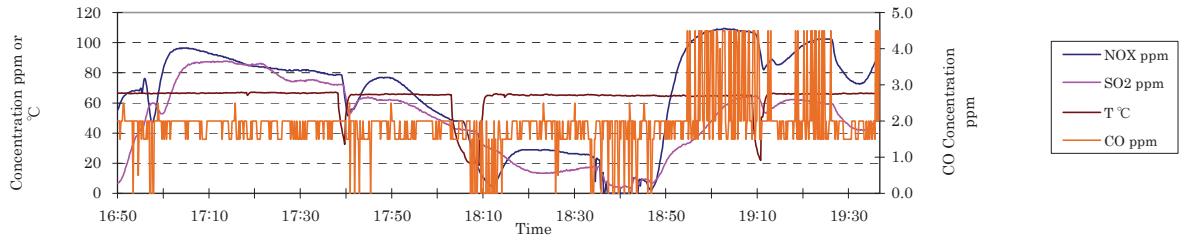
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

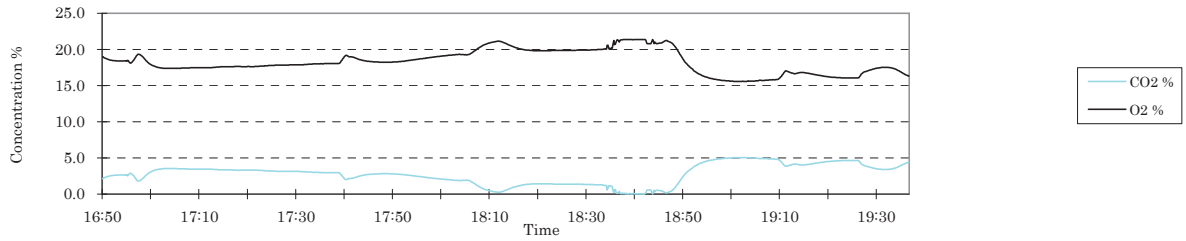
Date:	2012/1/24
Place:	No.3 Power Plant
HOB type:	No.10 boiler right duc
Boiler Capacity (kW):	220.00
Cross sectional area of duct (m2):	3.719
Type of Coal:	Buganuur

Comment:

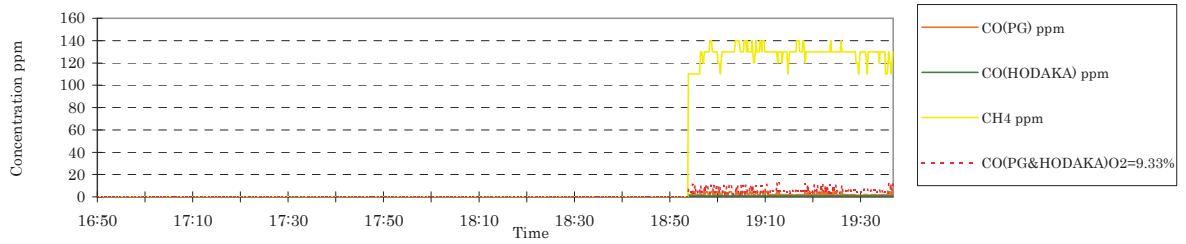
NOX,SO2,CO(Horiba),T



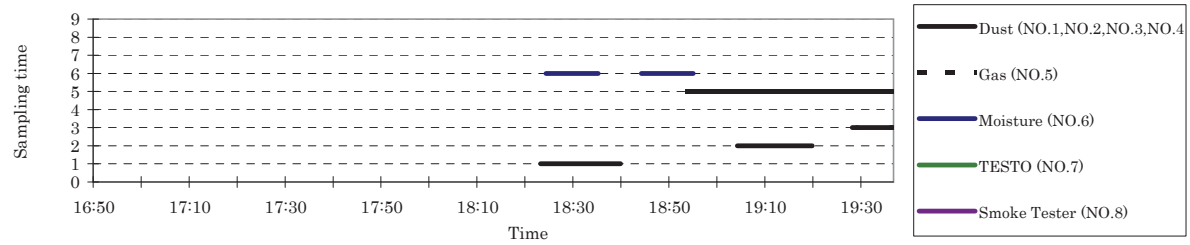
CO2,O2



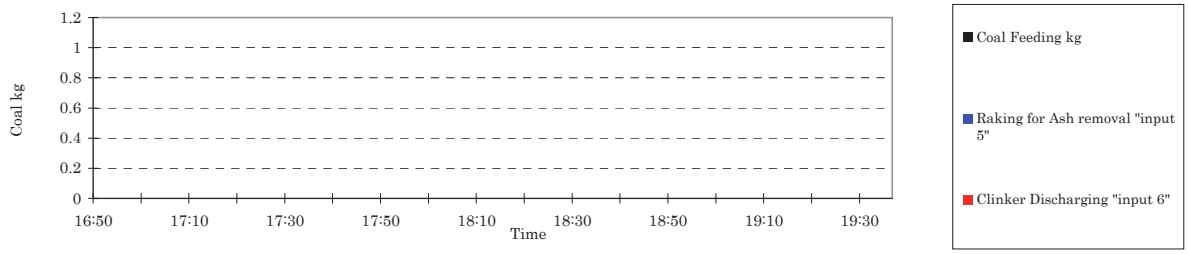
CO(PG-250),CO(HODAKA)



Sampling time (Target time)

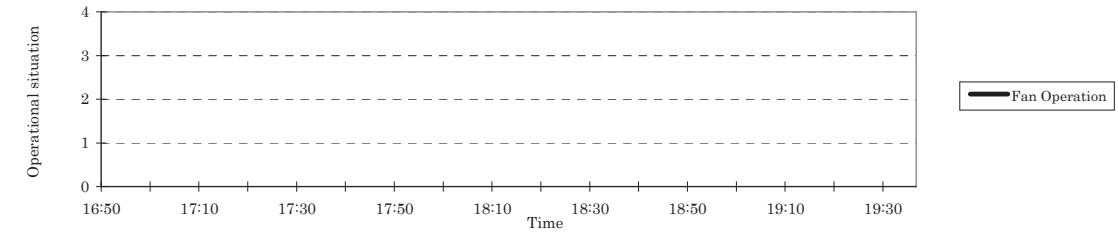


Coal Feeding 、Raking 、Clinker Discharging



Blue: Scratching for Ash removal (constant value"5") Red: Clinker Discharging (constant value"6")

HOB Fan Operational Situation



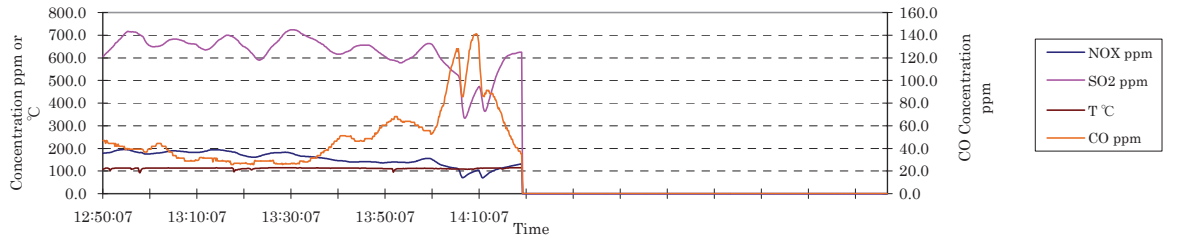
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

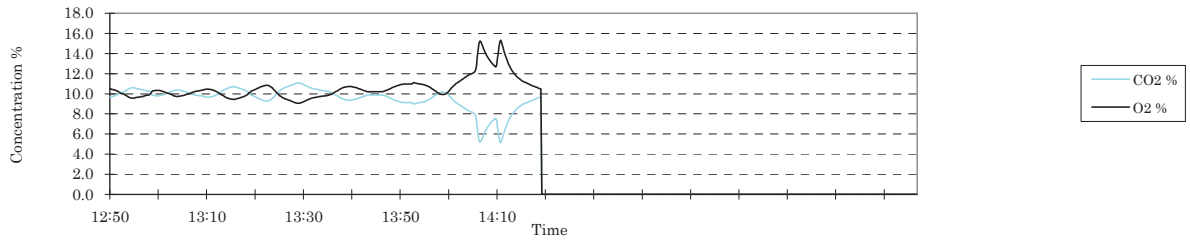
Date:	2013/1/15
Place:	#76 School
HOB type:	DZL-1.4
Boiler Capacity (kW):	1.40
Cross sectional area of duct (m2):	0.11
Type of Coal:	Nalaikh

Comment:

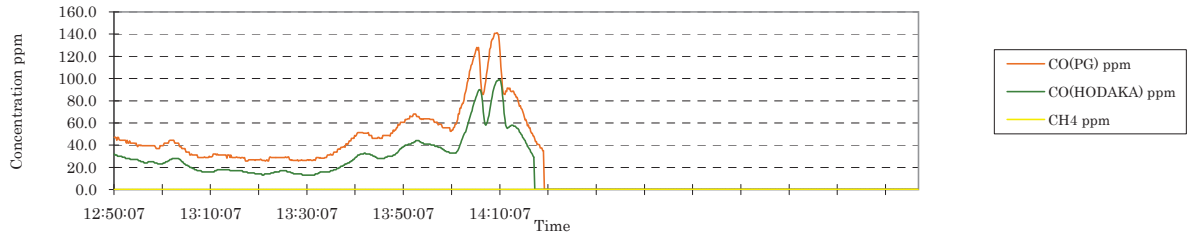
NOX,SO2,CO(Horiba),T



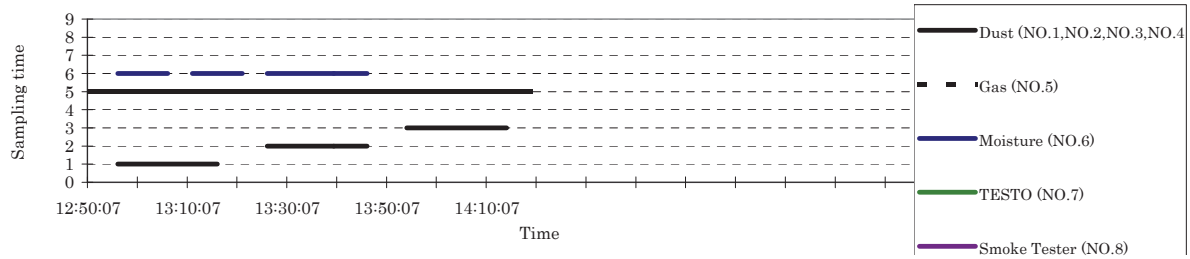
CO2,O2



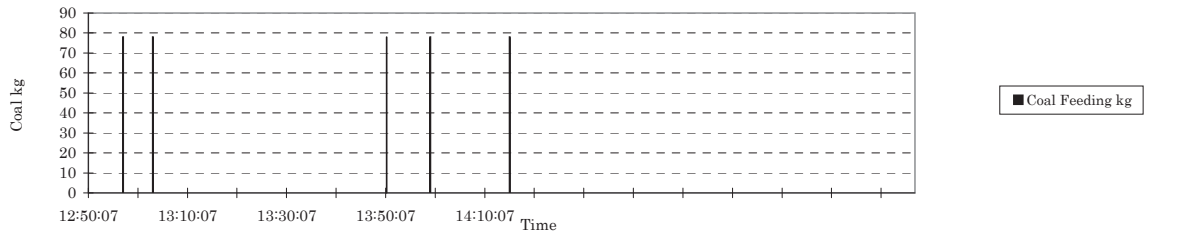
CO(PG-250),CO(HODAKA)



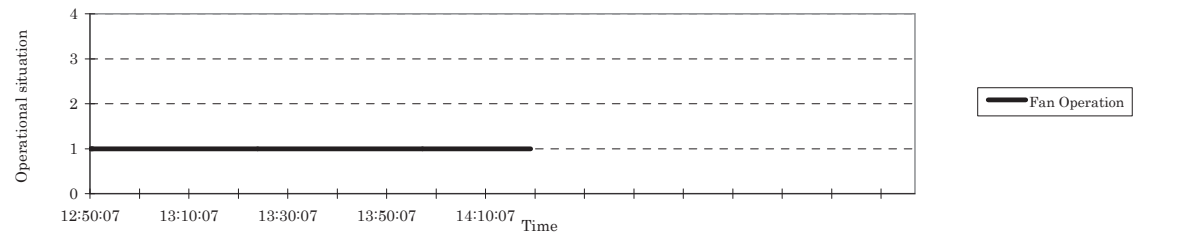
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



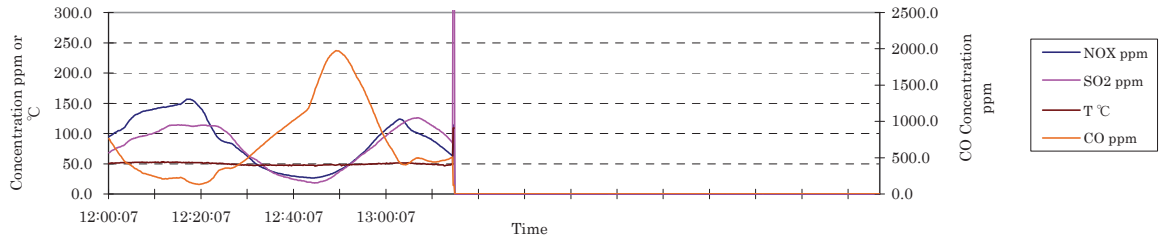
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

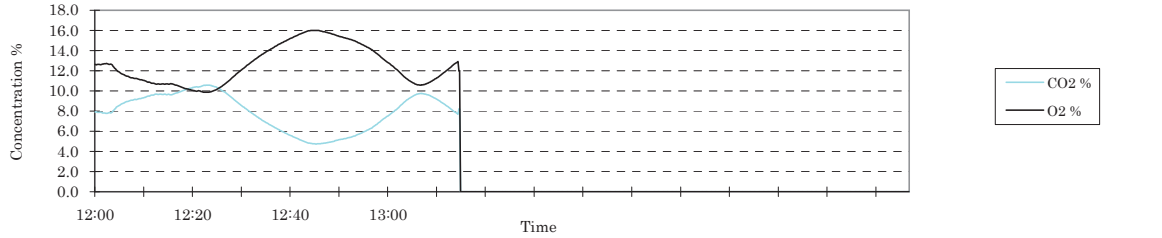
Date:	2013/1/16
Place:	#20 Kindergarten
HOB type:	DZL-0.7
Boiler Capacity (kW):	0.70
Cross sectional area of duct (m2):	0.164
Type of Coal:	Nalaikh

Comment:

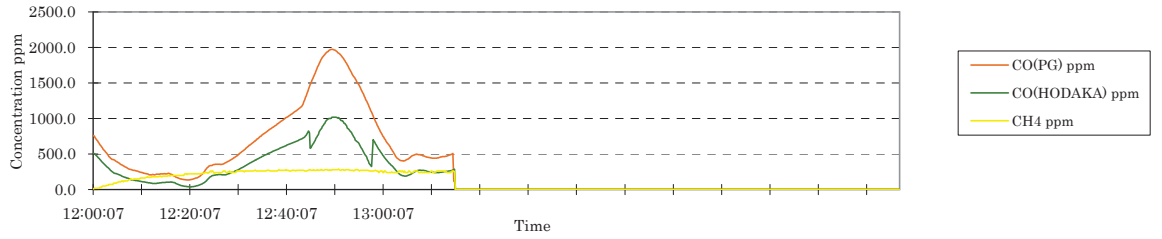
NOX,SO2,CO(Horiba),T



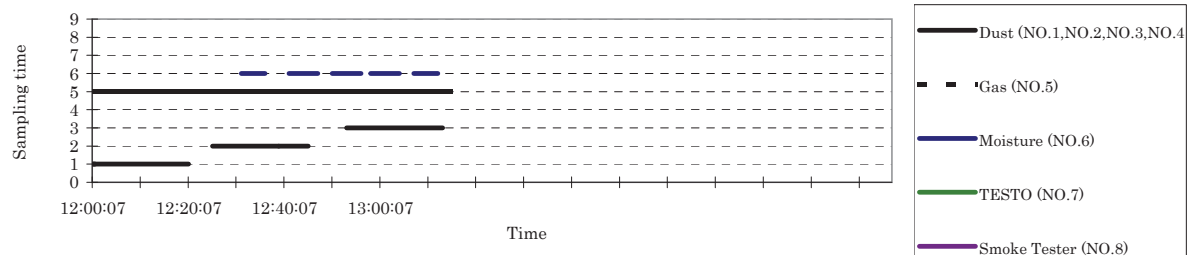
CO2,O2



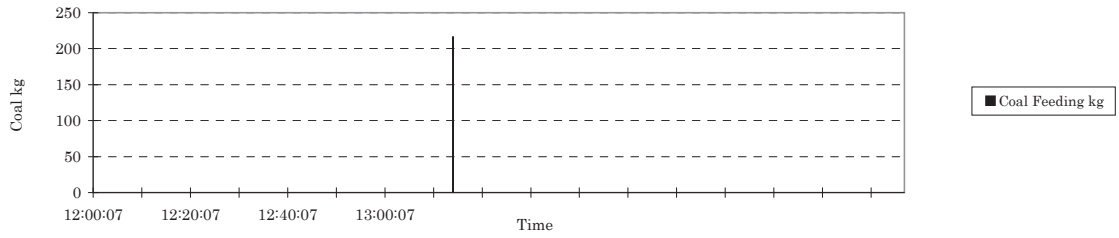
CO(PG-250),CO(HODAKA)



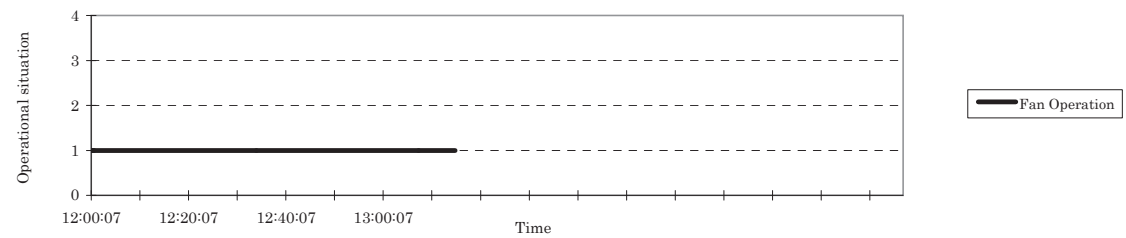
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

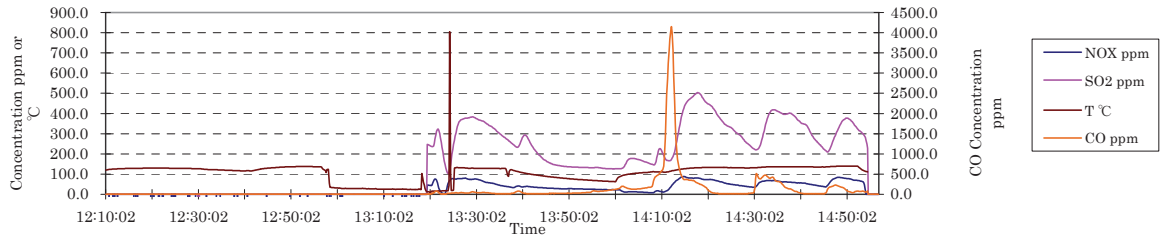
Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тооc, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

Date:	2013/1/31
Place:	#104 school
HOB type:	SHG 0.7
Boiler Capacity (kW):	0.35
Cross sectional area of duct (m2):	0.0324
Type of Coal:	Nalaikh

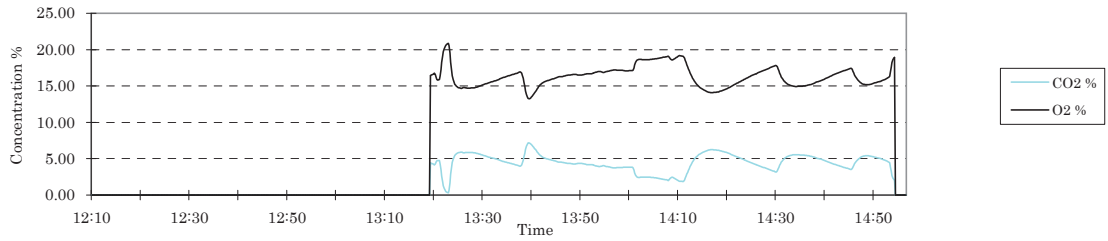
Comment:

Тоосны дээжийг соруулж байх явцад утааны хийн найрлаганы өгөгдлүүдийн бичилт хийгдээгүй байсан. Үүний шалтгаан нь Отгонбаяр мэдээлэл багцлагч /data logger/-г хэмжигч багажинд холбоогүй мартсанаас болсон бөгөөд үүнийг тоосны дээжийг хэмжиж дууссаны дараа анзаарсан бөгөөд дараа нь зөвхөн утааны хийн өгөгдлүүдийг дахин хэмжиж нэгтгэсэн.

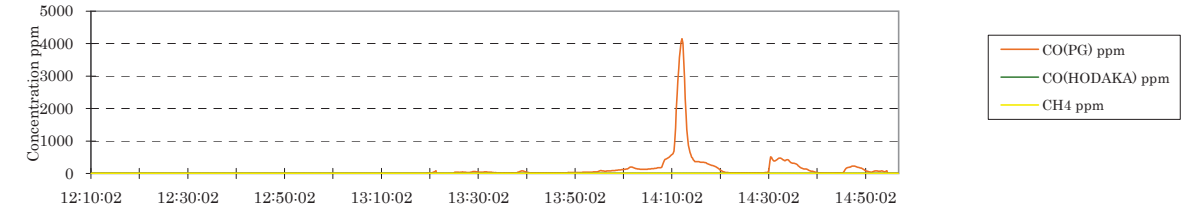
NOX,SO2,CO(Horiba),T



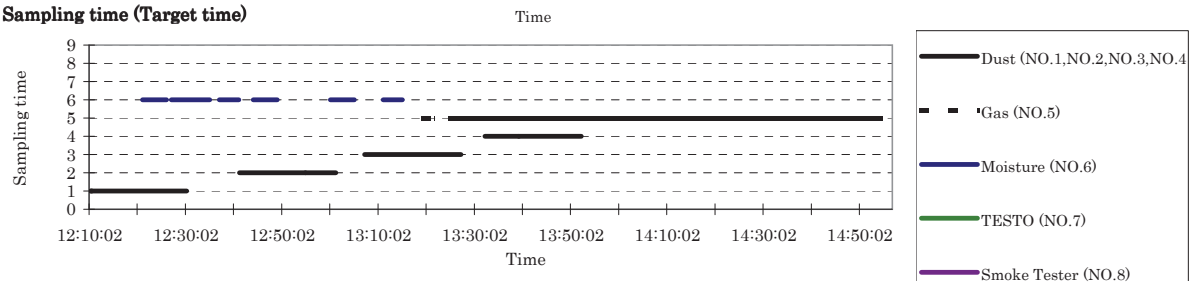
CO2,O2



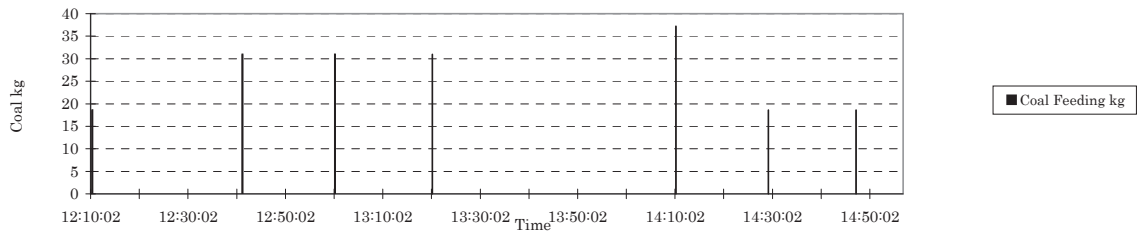
CO(PG-250),CO(HODAKA)



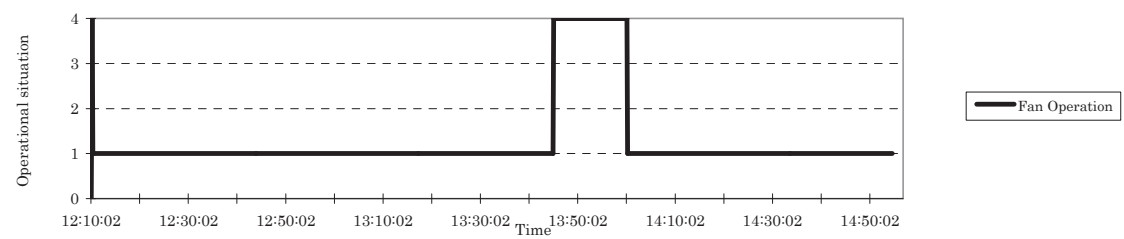
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



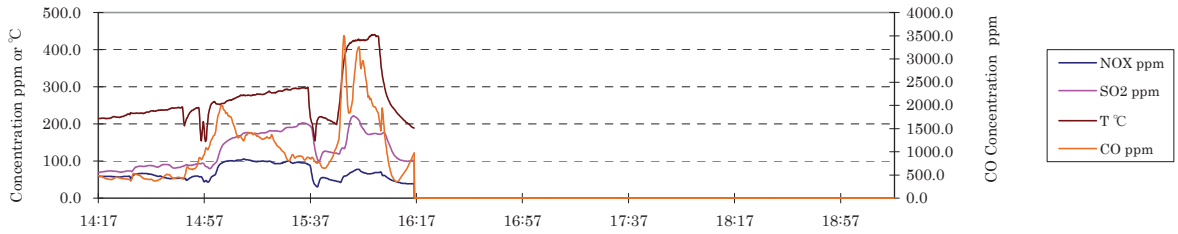
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

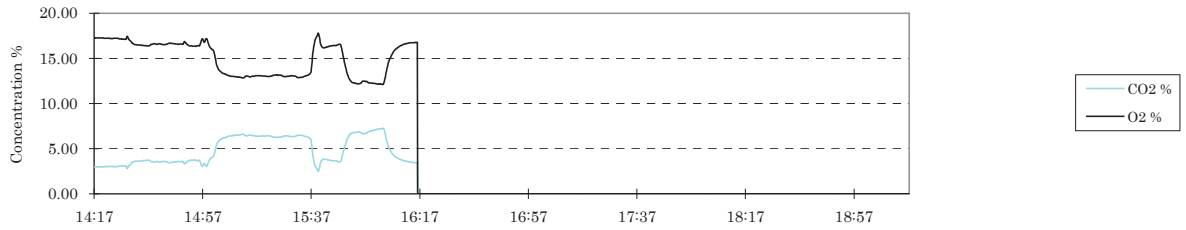
Date:	2013/1/21
Place:	Obi's ger
HOB type:	turky ger stove coal1
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.013
Type of Coal:	Nalaikh

Comment:

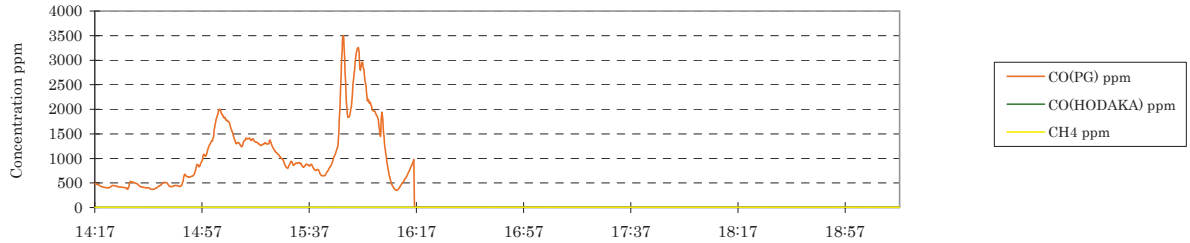
NOX,SO2,CO(Horiba),T



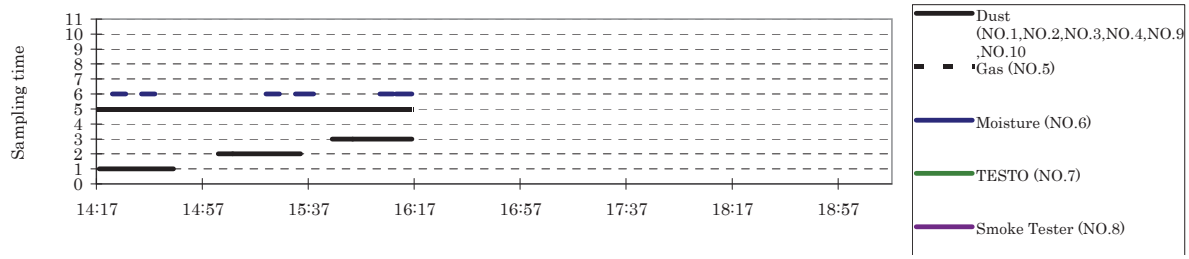
CO2,O2



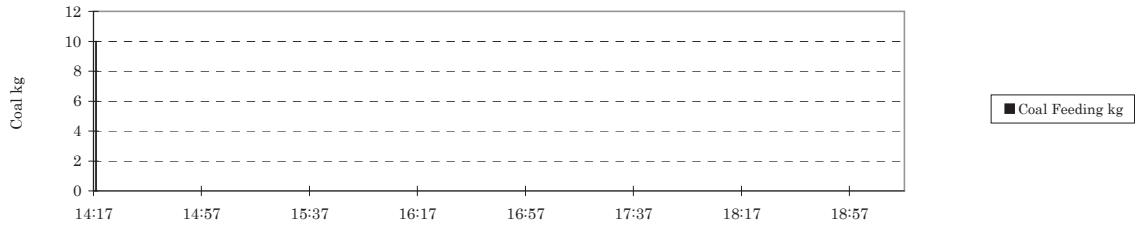
CO(PG-250),CO(HODAKA)



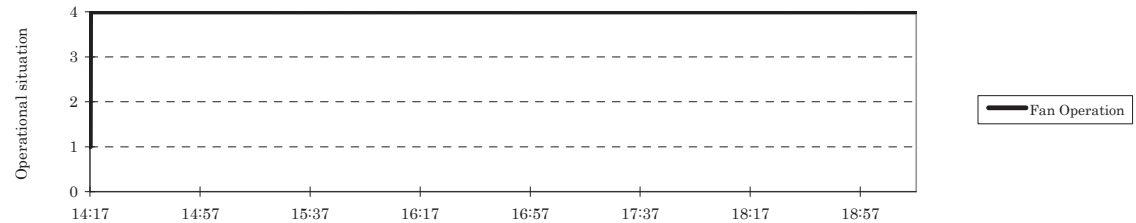
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

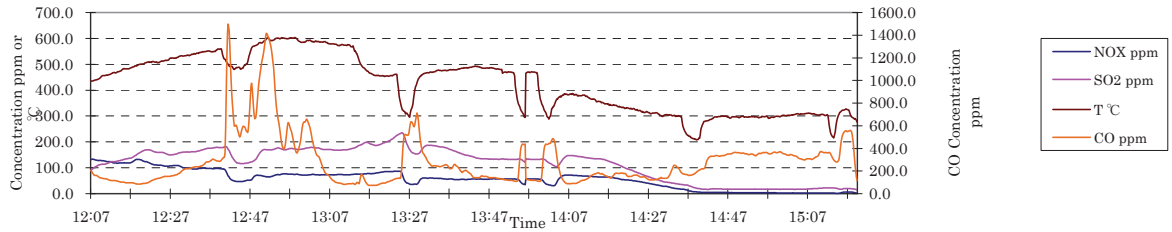
Graph of Measurement Result

Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тооc, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

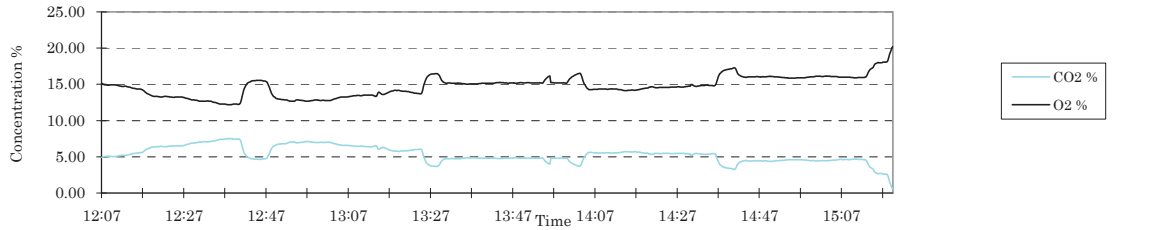
Date:	2013/1/22
Place:	Obi's ger
HOB type:	turky ger stove coal
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.013
Type of Coal:	Nalaikh

Comment:

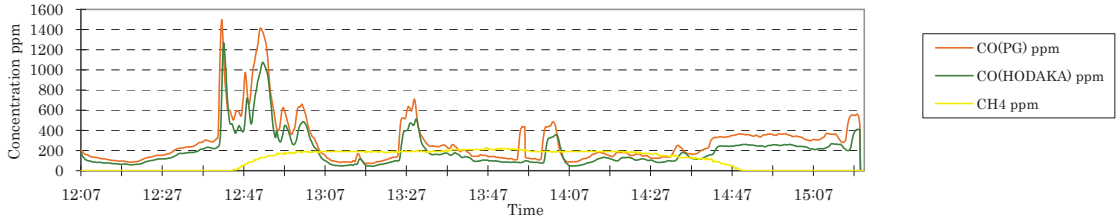
NOX,SO2,CO(Horiba),T



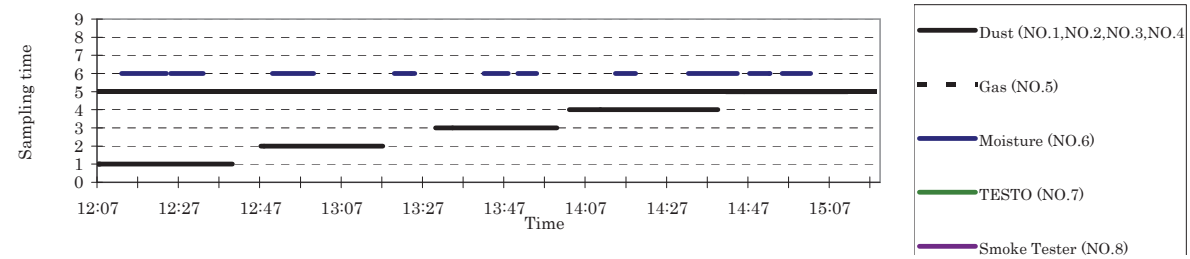
CO2,O2



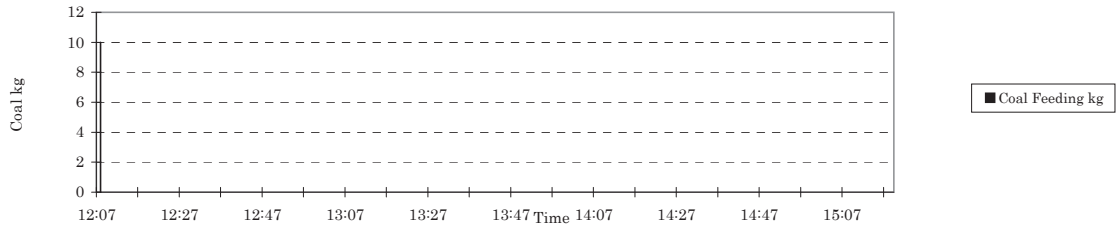
CO(PG-250),CO(HODAKA)



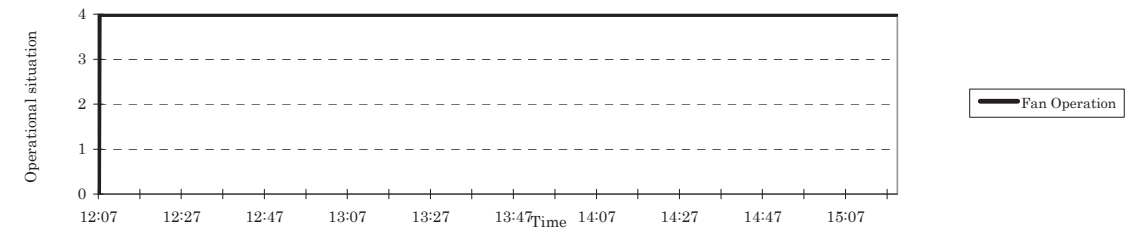
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

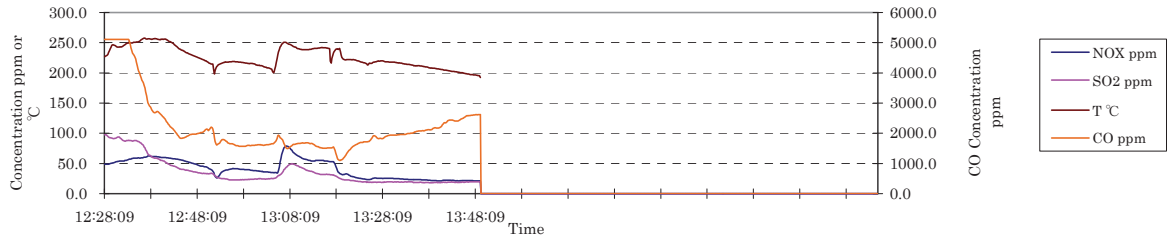
Graph of Measurement Result

Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тоос, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

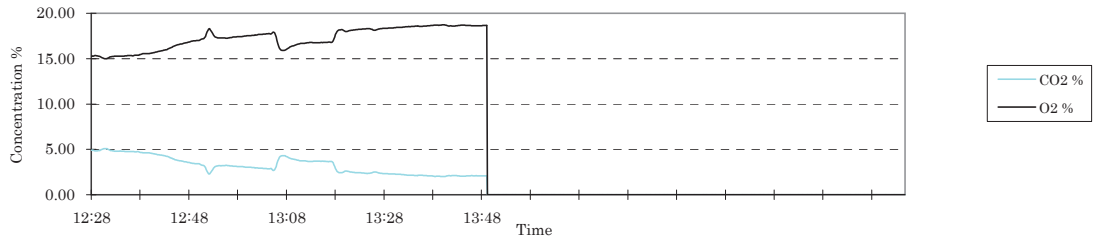
Date:	2013/1/28
Place:	Obi's ger
HOB type:	traditional ger stove
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.0079
Type of Coal:	Nalaikh

Comment:

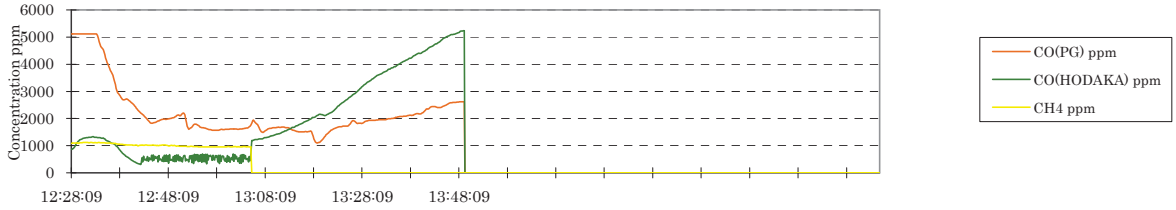
NOX,SO2,CO(Horiba),T



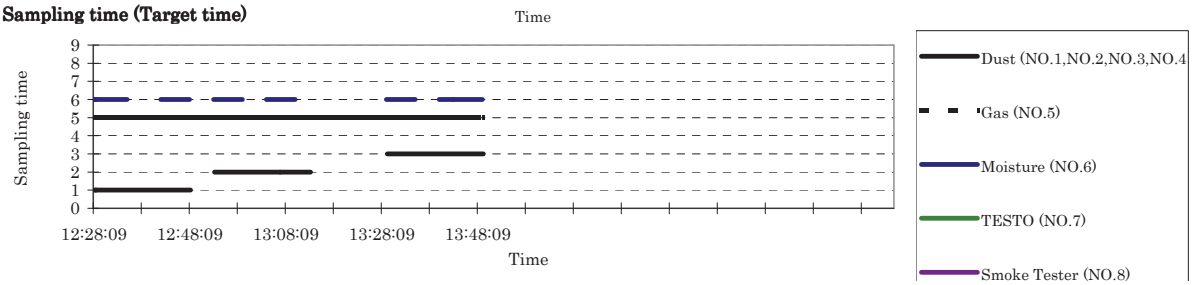
CO2,O2



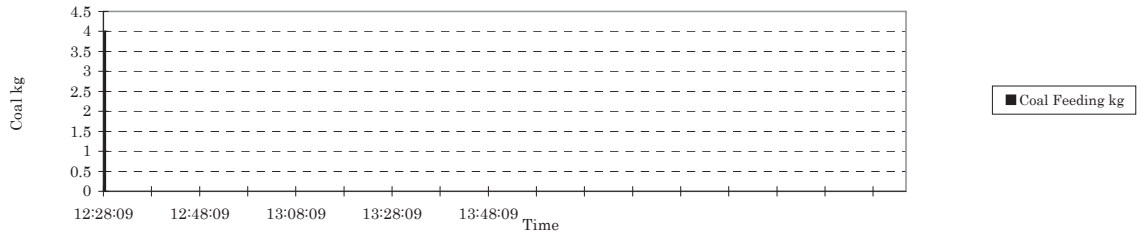
CO(PG-250),CO(HODAKA)



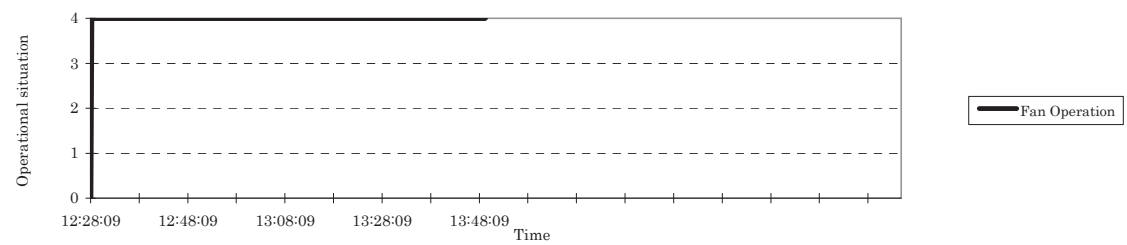
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

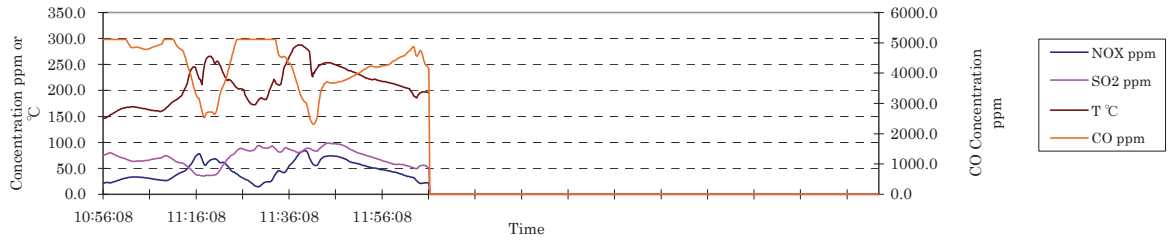
Graph of Measurement Result

Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тоос, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

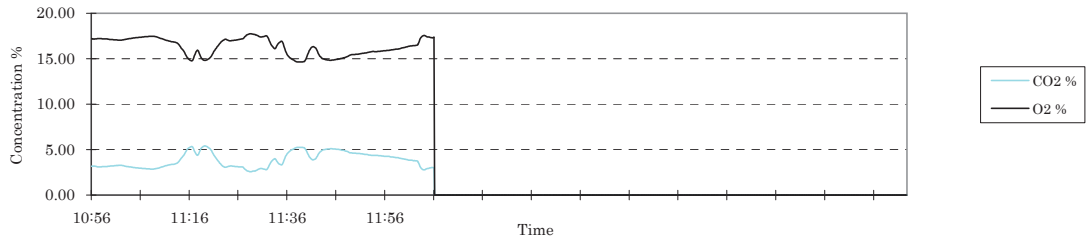
Date:	2013/1/29
Place:	Obi's ger
HOB type:	traditional ger stove
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.0079
Type of Coal:	Nalaikh

Comment:

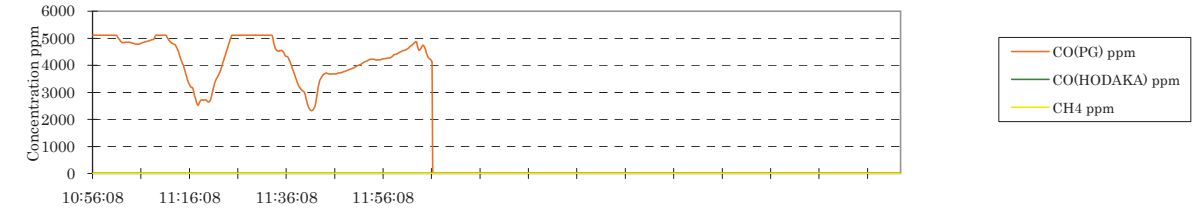
NOX,SO2,CO(Horiba),T



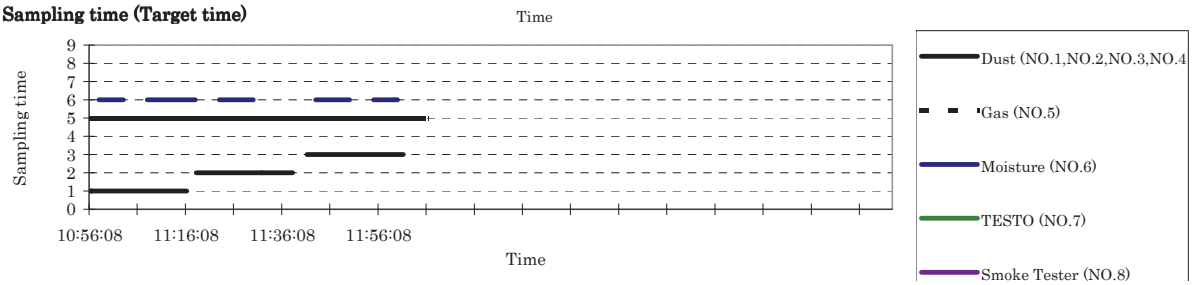
CO2,O2



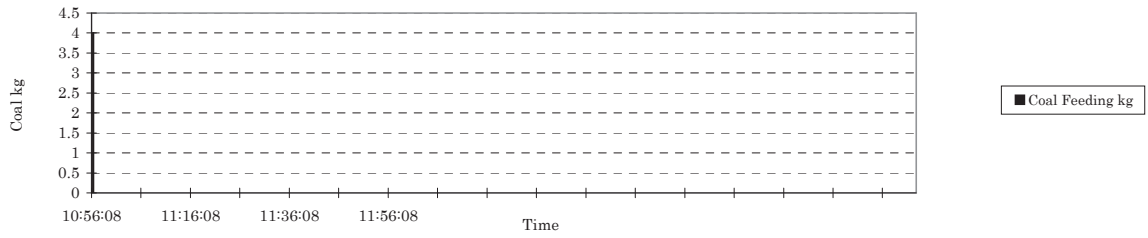
CO(PG-250),CO(HODAKA)



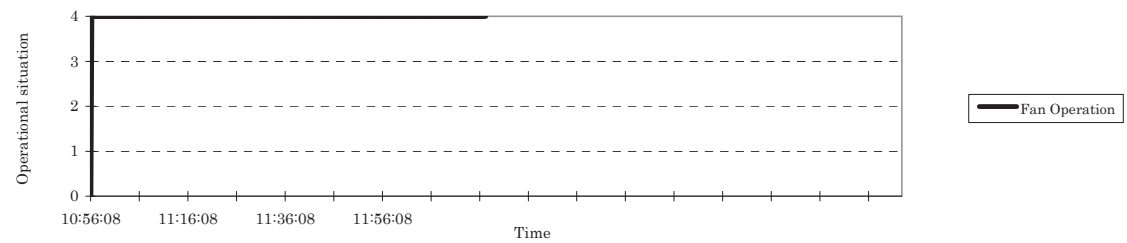
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

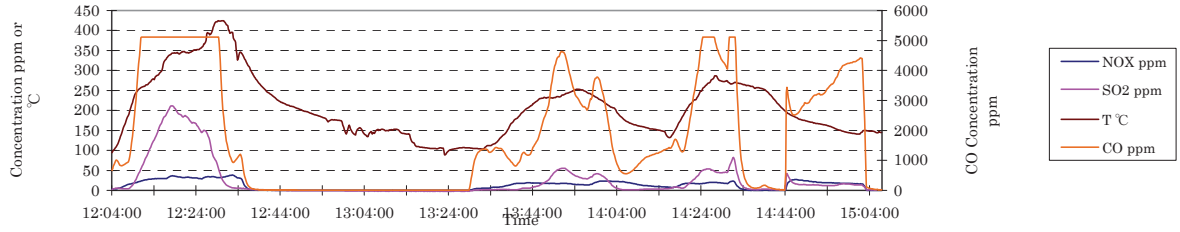
Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тооc, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

Date:	2013/1/23
Place:	Otgonbayal's ger
HOB type:	traditional ger stove
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.008
Type of Coal:	Vood briquet (Tunkhe

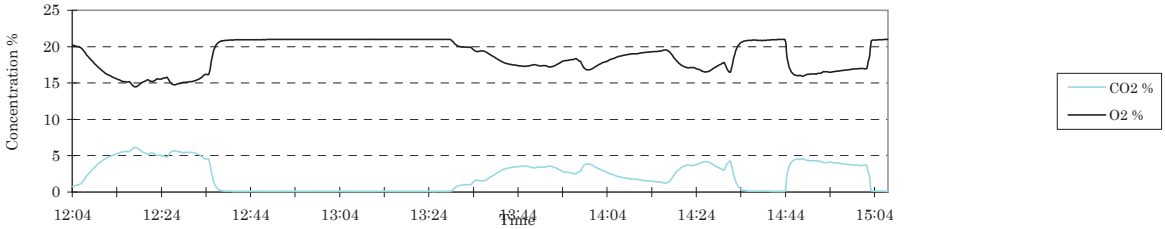
Comment:

12 цагт эхний 2 кг түлшийг зууханд хийж улмаар хэмжилтийг эхлүүлсэн боловч амжилтгүй болсон. Шаталтаас үүссэн давирхайнд дээжний фильтр бөглөрч задарсан. Бүх бэлтгэлийг дахин хангаж 11:32-т эхний 2 кг түлшийг хийж галыг асаасан. 13:35-д түлш бүрэн ноцсон. Нэмэлт 2 кг түлшийг 14:16-д зууханд хийсэн.

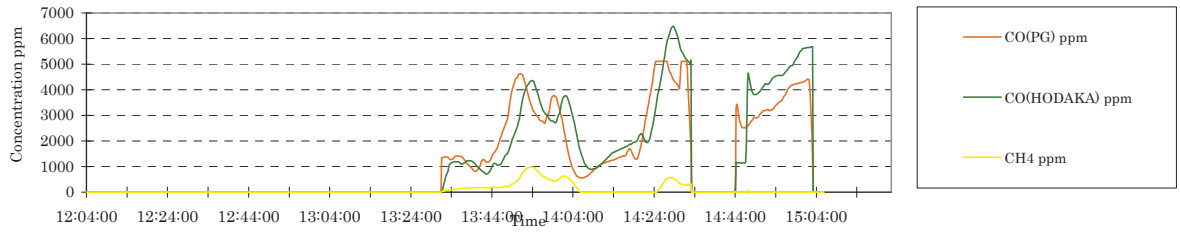
NOX,SO2,CO(Horiba),T



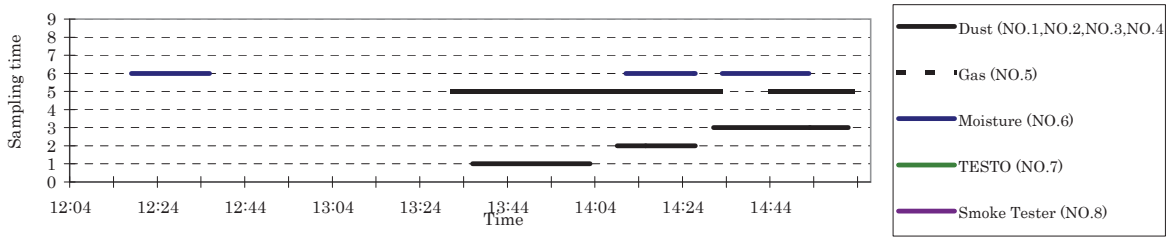
CO2,O2



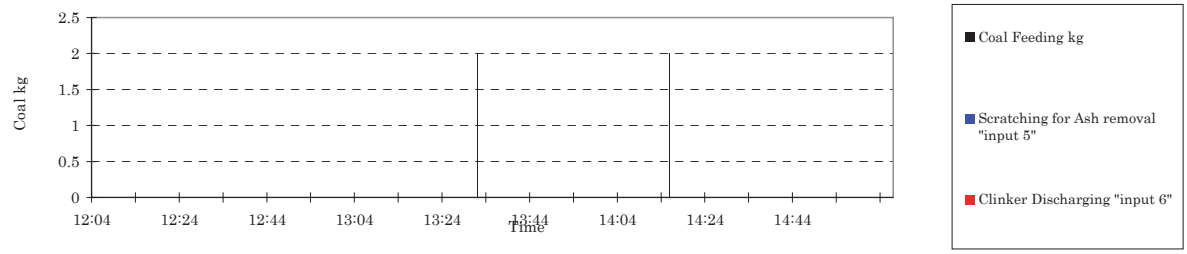
CO(PG-250),CO(HODAKA)



Sampling time (Target time)

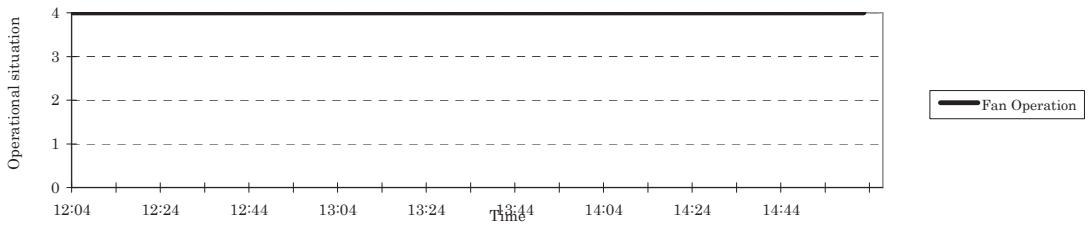


Coal Feeding 、Scratching 、Clinker Discharging



Blue: Scratching for Ash removal (constant value"5") Red: Clinker Discharging (constant value"6")

HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

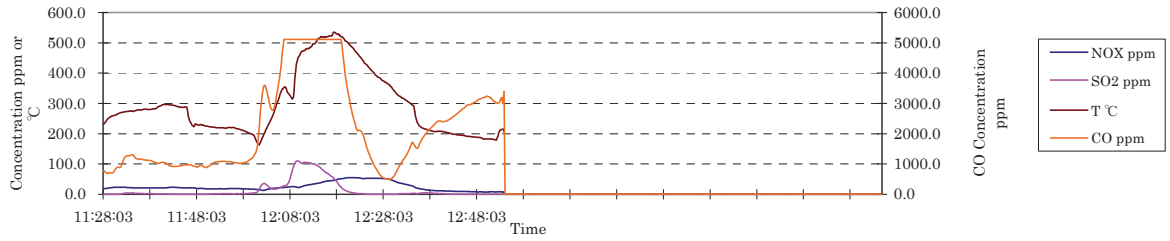
Graph of Measurement Result

Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тооc, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

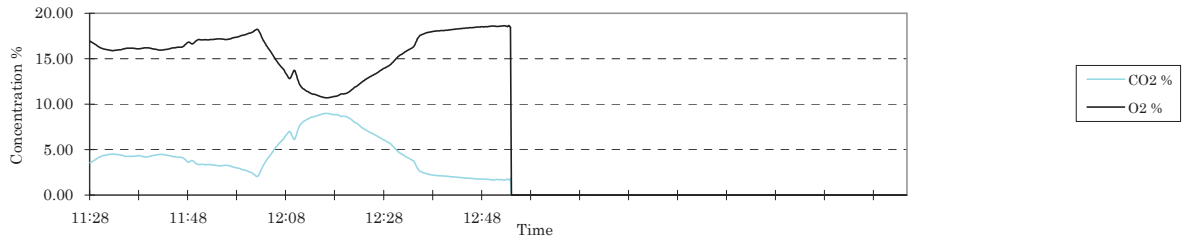
Date:	2013/1/24
Place:	Obi's ger
HOB type:	t raditional ger stove
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.0079
Type of Coal:	/ood briquet (Hyalgan

Comment:

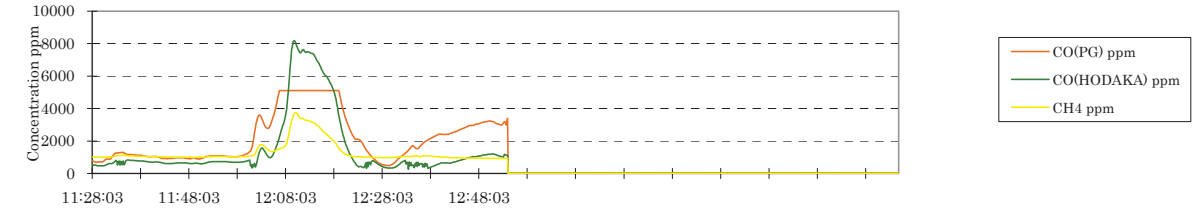
NOX,SO2,CO(Horiba),T



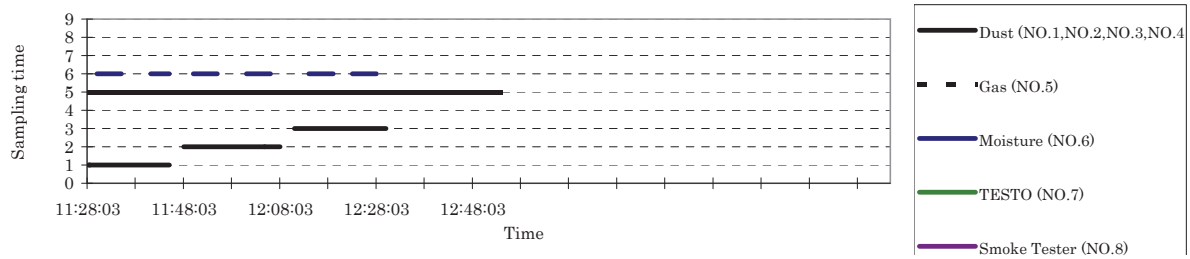
CO2,O2



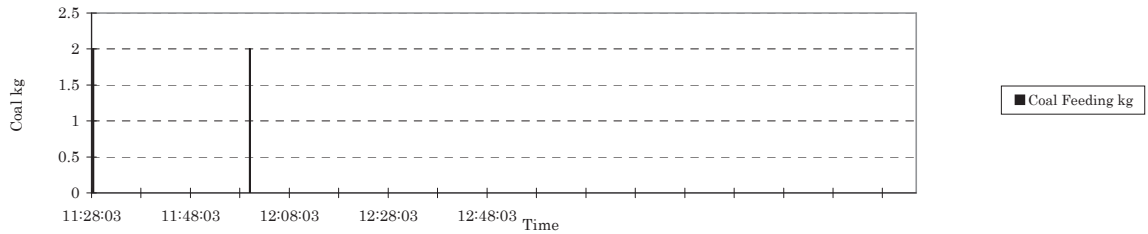
CO(PG-250),CO(HODAKA)



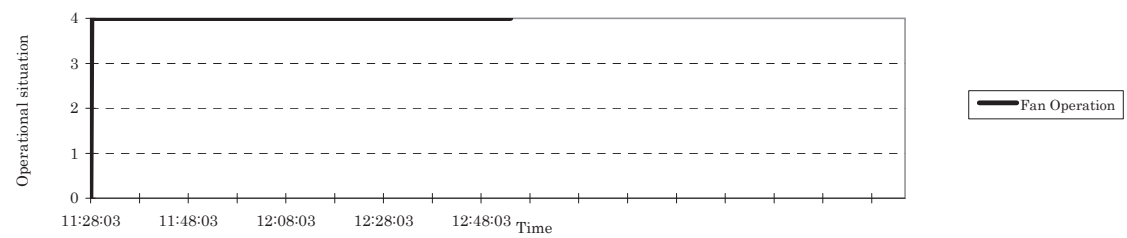
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



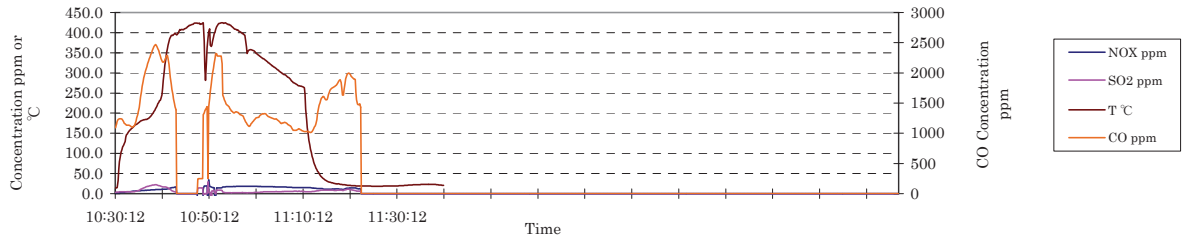
1:Forced and Induced 2:Induced 3:Forced 4:Natural

Graph of Measurement Result

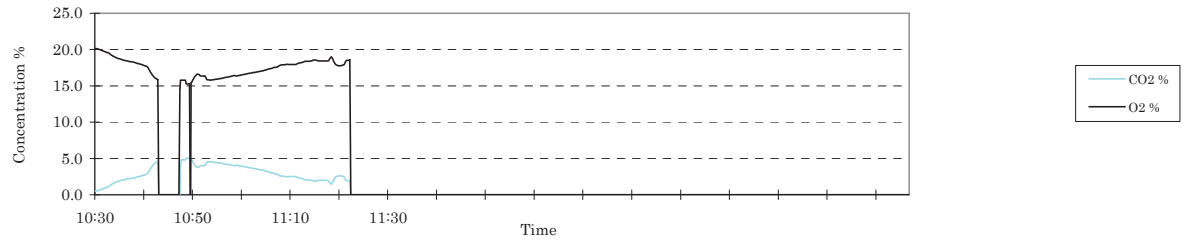
Date:	2013/1/25
Place:	Obi ger
HOB type:	tradional
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.008
Type of Coal:	ood briquet (2-step loa

Comment:

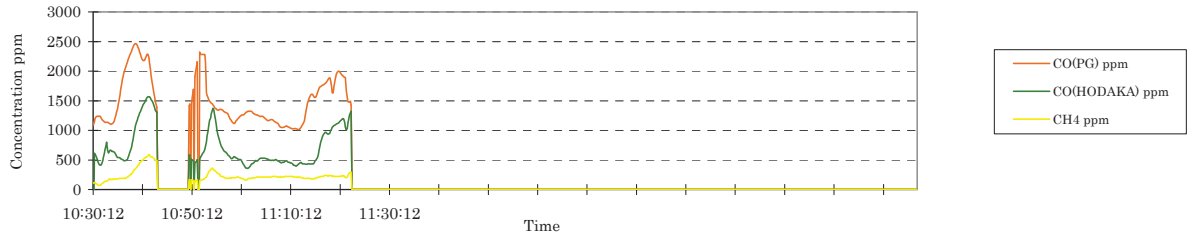
NOX,SO2,CO(Horiba),T



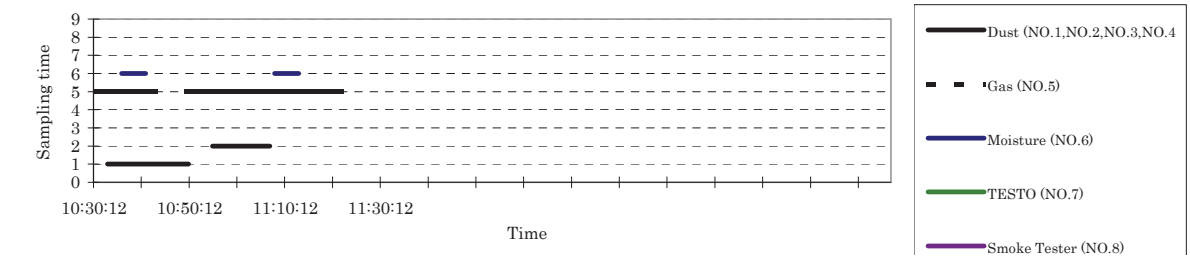
CO2,O2



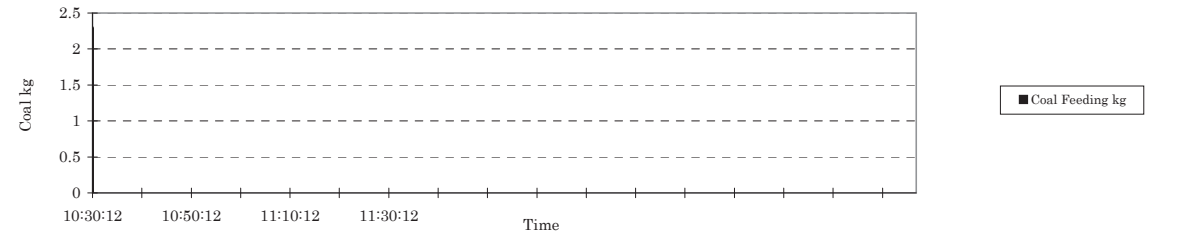
CO(PG-250),CO(HODAKA)



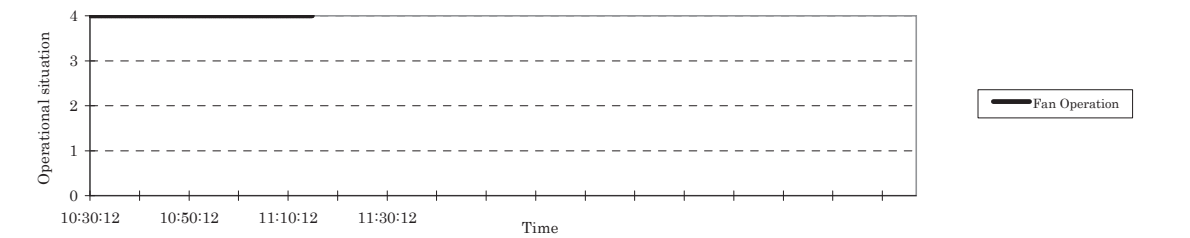
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

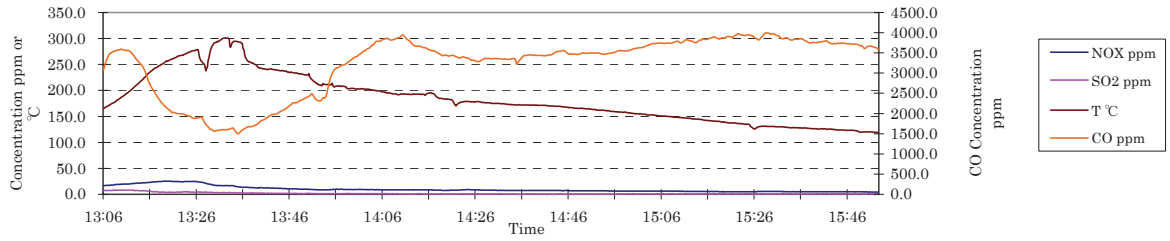
Graph of Measurement Result

Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тооc, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

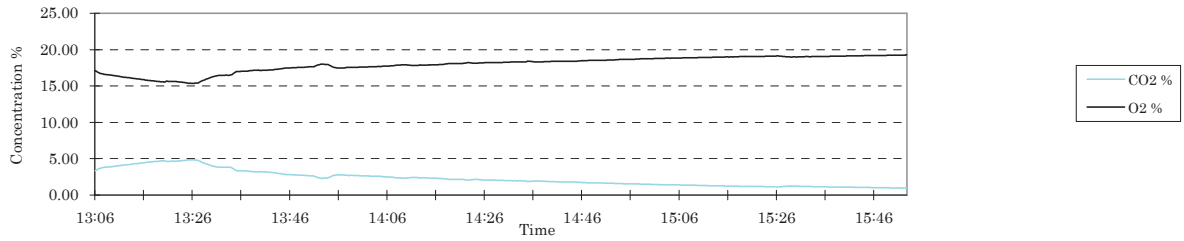
Date:	2013/1/24
Place:	Obi's ger
HOB type:	traditional ger stove
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.0079
Type of Coal:	semicoke (PP2)

Comment:

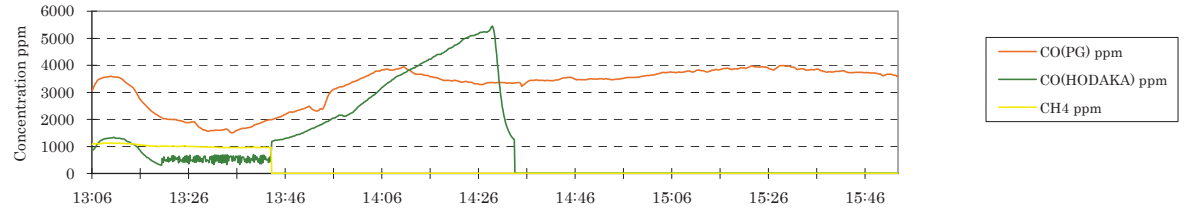
NOX,SO2,CO(Horiba),T



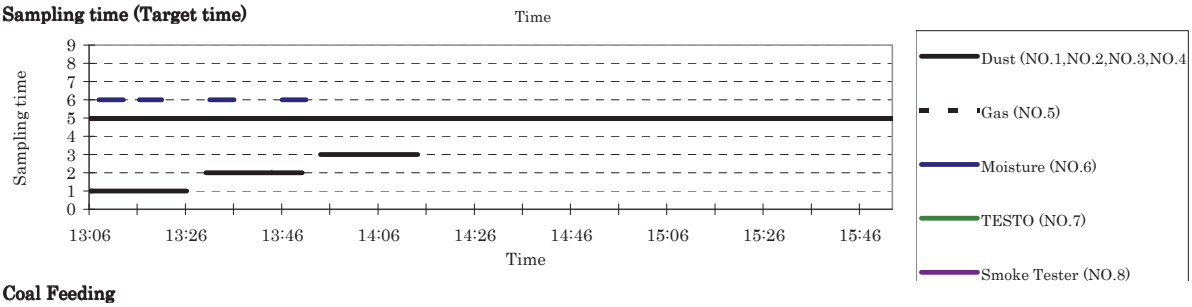
CO2,O2



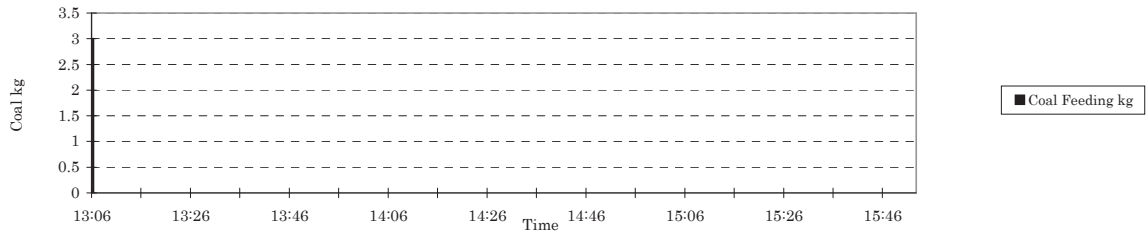
CO(PG-250),CO(HODAKA)



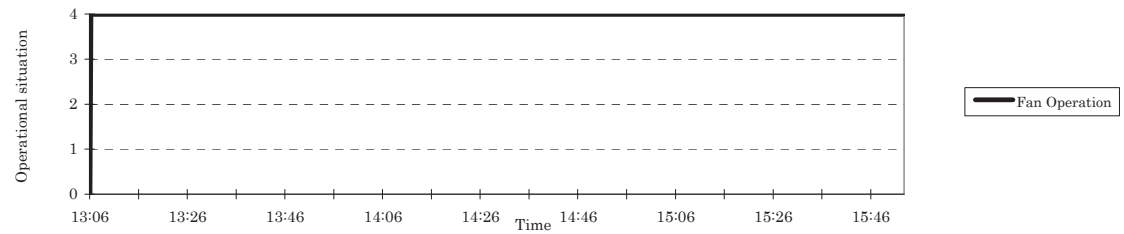
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural

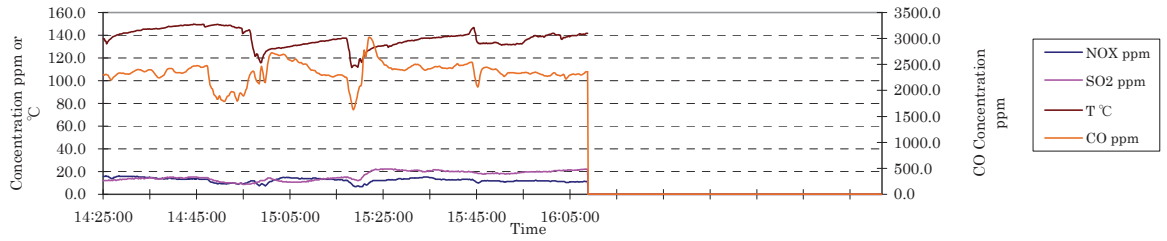
Graph of Measurement Result

Хэмжилтийн үзүүлэлтийн график (хийн агууламжийн өөрчлөлт, дээжний хугацаа (тоос, testo, smoke tester), нүүрс цэнэглэлтийн давтамж болон хугацаа, салхилуурын ажиллагаа)

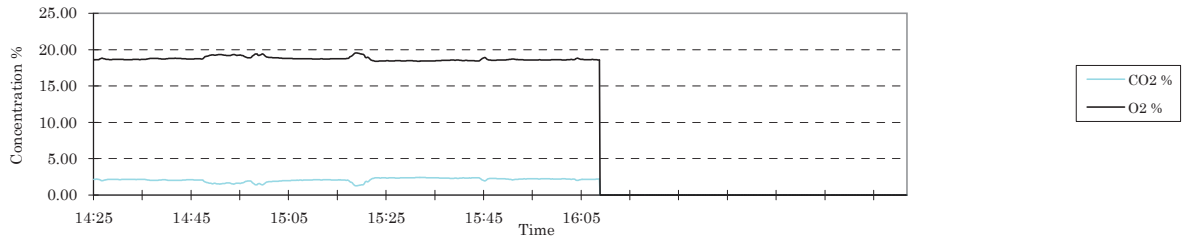
Date:	2013/1/28
Place:	Obi's ger
HOB type:	traditional ger stove
Boiler Capacity (kW):	-
Cross sectional area of duct (m2):	0.0079
Type of Coal:	emi coke briquet(MAF

Comment:

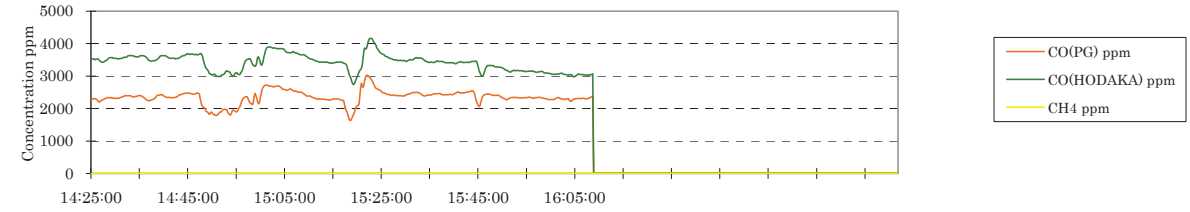
NOX,SO2,CO(Horiba),T



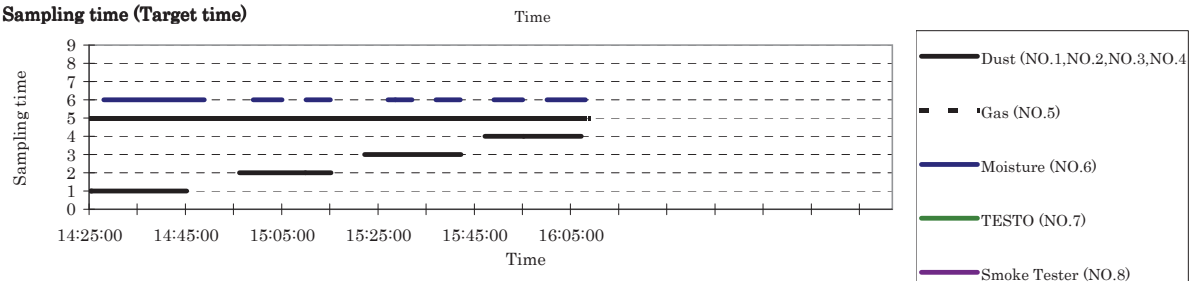
CO2,O2



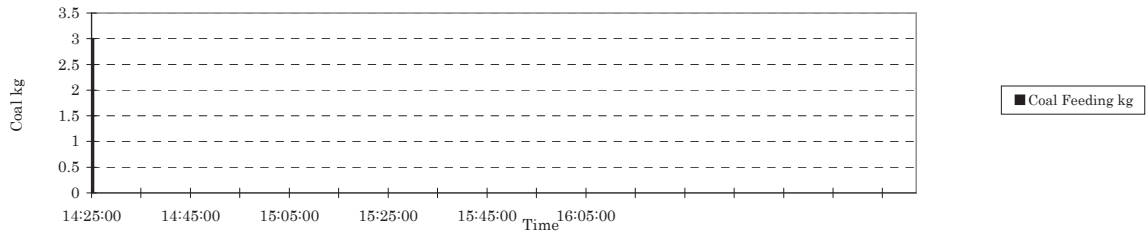
CO(PG-250),CO(HODAKA)



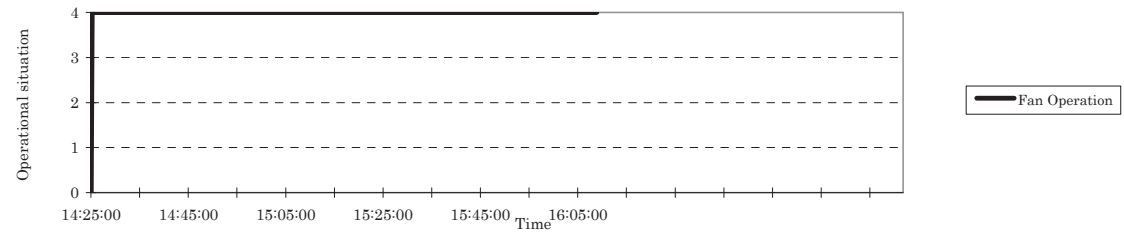
Sampling time (Target time)



Coal Feeding



HOB Fan Operational Situation



1:Forced and Induced 2:Induced 3:Forced 4:Natural