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PART I: SECTION (I) — GENERAL

Government Notifications

L.D.B. 4/81(VIII)

NATIONAL ENVIRONMENTAL ACT No. 47 OF 1980

REGULATIONS made by the President under Section 32 of the National Environmental Act, No. 47 of 1980, read with Sections 23J, 23K and 23L of that Act and Section 51 of the Nineteenth Amendment to the Constitution of the Democratic Socialist Republic of Sri Lanka.

Maithripala Sirisena, President.

Colombo, 05th June, 2019.

REGULATIONS

- 1. These Regulations may be cited as the National Environmental (Stationary Sources Emission Control) Regulations, No. 01 of 2019.
- 2. Any person who manages or is in control off any stationary source specified in Schedule I hereto which emanates stack emissions, shall construct such stationary source in conformity with the standards specified in Schedule II hereto.



- 2A
- 3. All emissions from stationary sources which are not specified in Schedule I, shall comply with the standards specified in Part I and II of Schedule III hereto.
- 4. All fugitive emissions emanating from any industrial process shall be measured and controlled according to the methods and standards specified in Schedules IV, V, VI and VII hereto.
- 5. The methods approved by the Central Environmental Authority (hereinafter referred to as the "Authority") shall be used in the measurement of emissions.
- 6. The concentration of any stationary source emission measured shall be converted into dry condition. The following equation shall be used for such conversion:-

DRY GAS CONCENTRATION =
$$\frac{\text{MEASURED CONCENTRATION}}{[100 - (\text{MOISTURE PERCENTAGE})]} \times 100$$

7. The stationary source emission concentration converted into dry condition under Regulation 6, shall be converted into standard condition. The following equation shall be used for such conversion:-

$$C_n(mg / Nm^3) = C_s(mg/m^3) \times \frac{(P_n \cdot T_s)}{(P_s \cdot T_n)}$$

where

C_n = Emission concentration at standard conditions

C_s = Converted dry emission concentration

 $P_n = Standard pressure 760 mmHg$

P = Stack pressure in mmHg

 $T_n = Standard temperature 273 Kelvin$ $<math>T_n = Stack temperature in Kelvin$

8. The stationary source emission concentration converted into standard condition under Regulation 7 shall be converted for relevant reference oxygen level specified in Schedule VIII hereto. The following equation shall be used for such conversion:-

$$E_r(mg / Nm^3) = E_m (mg / Nm^3) \left[\frac{20.9 - O_2 \%_{ref}}{20.9 - O_2 \%_m} \right]$$

where

 E_r = Emission concentration at fuel specific reference oxygen percentage

 E_m = Standardized emission concentration

 $O_2^m \%_{ref}$ = Reference Oxygen percentrage of fuel type specified in Schedule VIII

 $O_2 \%_m = \text{Measured volume percentage of oxygen level on dry basis.}$

9. Where the fuel type is not specified in Schedule VIII, the reference oxygen level shall be six percent (6%): Provided that, where there is a mixed-fuel usage, the major fuel type based on energy input shall be considered. Reference oxygen level shall be ten percent (10%) for incinerators.

10. In the case of multi-fuel usage, for each fuel, the standards specified in Schedule II hereto shall be applied.

11. Minimum stack height of any combustion point source shall be determined by the following equation.

$$C(m) = H(m) + 0.6U(m)$$

where H = The height in meters of the tallest building within 5U radius of the point source.

C = Minimum stack height in meters.

U = Uncorrected stack height in meters.

U shall be determined by following equation.

$$U(m) = 1.36Q^{0.6}$$

where Q = Gross heat imput in Mega Watt (MW)

- (i) This rule shall be applied for the combustion source with gross heat input greater than 0.620MW.
- (ii) In any case, stack height shall not be less than 20 meters except for the combustion sources with gross heat input less than 0.620 MW.
- 12. In relation to thermal power plants and to any other combustion source, air pollution caused by Sulfur Dioxide (SO₂) emission shall be controlled by fuel quality, stack height or Sulfur Dioxide emission control devices to maintain the existing embient air quality standards. Minimum stack height shall be determined by accepted air quality modelling software. In the absence of such modelling software, with the approval of the Authority, following equation shall be applied to determine the minimum stack height in meters.

Minimum stack height
$$H(m) = 140^{0.25}$$

Where Q is Sulfur Dioxide (SO₂) emission rate kg/hour.

- 13. Emissions from Crematoriums shall be controlled by emission reduction devices incorporated into the stack of the crematorium.
- 14. Dioxin and Furan emissions form incinerators shall be controlled by maintaining temperature between 1000° C to 1250° C and 2-3 seconds retention time in secondary chamber.
- 15. No person shall emit or discharge any pollutant to atmosphere exceeding the pollutant based emision limits specified in Schedule III hereto.
- 16. Any person who fails to comply with the above regulations, shall be liable to an offence under the National Environmental Act, No. 47 of 1980.

17. In these regulations:-

"Authority" means the Central Environmental Authority established under the National Environmental Act, No. 47 of 1980;

"PM" means Particulate Matter;

"ppm" means parts per million;

"Nm3" means cubic meter of air at standard conditions of 0°C temperature and 760 mmHg Pressure;

"Nitrogen Oxides (NO_x)" means total concentration of Nitric Oxide (NO) and Nitrogen Dioxide (NO₂) gas emissions from a stack.

(Regulation 2)

SCHEDULE I

- 1. Thermal Power Plants
- 2. Standby Generators
- 3. Boilers
- 4. Thermic Fluid Heaters
- 5. Incinerators
- 6. Cupolas, Blast Furnaces, Coke Ovens, Basic Oxygen Furnaces, Electric (induction & arc) furnaces
- 7. Cement Kilns

(Regulation 2)

SCHEDULE II

Instrument/Equipment Based Standards

Part I

THERMAL POWER PLANTS

Fuel	Rated Output Capacity (C)	Type of Pollutant	Emission Limit	
	C<1 MW	Particulate Matter (PM), Sulfur Dioxide (SO ₂), Nitrogen Oxides (NO _x)	Shall be controlled by fuel quality and stack height as set out in Regulations 11 and 12	
		Smoke	20% Opacity	
		Sulfur Dioxide (SO ₂)	Shall be controlled by fuel quality and stack height as set out it. Regulation 12	
	1≤C<3 MW		650mg/Nm³ for steam turbine	
	156<23 MIW	Nitrogen Oxides (NO _x)	550mg/Nm³ for gas turbine/combined cycle turbine 850mg/Nm³ for internal combustion engines	
		Particulate Matter (PM)	200mg/Nm ³	
		Smoke	20% Opacity	
Oil		Sulfur Dioxide (SO ₂)	Shall be controlled by fuel quality and stack height as set out in Regulation 12	
			600mg/Nm³ for steam turbine	
		Nitrogen Oxides (NO _x)	500mg/Nm³ for gas turbine/combined cycle turbine	
			850mg/Nm³ for internal combustion engines	
		Particulate Matter (PM)	150mg/Nm ³	
		Smoke	20% Opacity	
		Sulfur Dioxide (SO ₂)	Shall be controlled by fuel quality and stack height as set out in Regulations 12	
			550mg/Nm³ for steam turbine	
	25 <u><</u> C<100 MW	Nitrogen Oxides (NO _x)	450mg/Nm³ for gas turbine/combined cycle turbine	
			700mg/Nm³ for internal combustion engines	
		Particulate Matter (PM)	150mg/Nm ³	
		Smoke	20% Opacity	
	C≥ 100 MW	Sulfur Dioxide (SO ₂)	1. 850mg/Nm³ for new power plants with maximum 28kg SO ₂ per day per MW subject to maximum 14 metric tons of SO ₂ /day for first 500MW plus 10kg SO ₂ per day per MW for each additional MW.	
			Shall be controlled by fuel quality for existing power plants	

SCHEDULE II (Contd.)

Instrument/Equipment Based Standards

Part I

THERMAL POWER PLANTS

Fuel	Rated Output Capacity (C)	Type of Pollutant	Emission Limit	
		Nitrogen Oxides (NO _x)	500mg/Nm³ for steam turbine	
Oil			450mg/Nm³ for gas turbine/combined cycle turbine	
			650mg/Nm³ for internal combustion engines	
		Particulate Matter (PM)	150mg/Nm ³	
	-	Smoke	20% Opacity	
	C O S MW	Particulate Matter (PM)	Shall be controlled by stack height as set out in Regulation 11	
	C<0.5 MW	Nitrogen Oxides (NO _x)		
		Smoke	25% Opacity	
Biomass		Nitrogen Oxides (NO _x)	$\frac{1}{500 \text{mg/Nm}^3}$	
Diomass	0.5≤C<3MW	Particulate Matter (PM)	$\frac{250 \text{mg/Nm}^3}{250 \text{mg/Nm}^3}$	
		Smoke	25% Opacity	
		Nitrogen Oxides (NO _x)	$\frac{1}{450 \text{mg/Nm}^3}$	
	C≥3MW	Particulate Matter (PM)	$200 \mathrm{mg/Nm^3}$	
		Smoke	20% Opacity	
		Sulfur Dioxide (SO ₂)	1600mg/Nm ³	
		Nitrogen Oxides (NO ₂)	$\frac{750 \text{mg/Nm}^3}{}$	
	C<50MW	Particulate Matter (PM)	200mg/Nm ³	
		Smoke	20% Opacity	
			1. 850mg/Nm³ for new power plants with maximum 50kg	
			SO ₂ per day per MW subject to maximum 30 metric tons	
		Sulfur Dioxide (SO ₂)	of SO ₂ /day for first 500MW plus 25kg SO ₂ per day per	
Coal	C≥50MW	<u>-</u>	MW for each additional MW.	
	C <u>></u> 50W W		2. Shall be controlled by fuel quality for existing power	
			plants	
		Nitrogen Oxides (NO _x)	650mg/Nm^3	
		Particulate Matter (PM)	150mg/Nm ³	
		Smoke	15% Opacity	
		Sulfur Dioxide (SO ₂)	75mg/Nm^3	
		2	350mg/Nm³ for steam turbine	
	C<50MW	Nitrogen Oxides (NO ₂)	250mg/Nm³ for gas turbine/combined cycle turbine	
			400mg/Nm³ for internal combustion engines	
Natural		Particulate Matter (PM)	$100 \mathrm{mg/Nm^3}$	
Gas		Sulfur Dioxide (SO ₂)	75mg/Nm³	
			300mg/Nm³ for steam turbine	
	C≥50MW	Nitrogen Oxides (NO _x)	200mg/Nm³ for gas turbine/combined cycle turbine	
		^	350mg/Nm³ for internal combustion engines	
		Particulate Matter (PM)	75mg/Nm^3	

SCHEDULE II (Contd.)

Instrument/Equipment Based Standards

Part I

THERMAL POWER PLANTS

Fuel	Rated Output Capacity (C)	Type of Pollutant	Emission Limit
		Sulfur Dioxide (SO ₂)	75mg/Nm^3
Naphtha	Any		350mg/Nm³ for steam turbine
		Nitrogen Oxides (NO _x)	250mg/Nm³ for gas turbine/combined cycle turbine
			400mg/Nm³ for internal combustion engines
		Particulate Matter (PM)	75mg/Nm³
	Any	Sulfur Dioxide (SO ₂)	70mg/Nm^3
		Nitrogen Oxides (NO _x)	$400 mg/Nm^3$
		Particulate Matter (PM)	150mg/Nm ³
Munici-		Smoke	20% Opacity
pal		Carbon Monoxide (CO)	50mg/Nm³
Solid		Hydrogen Chloride (HCI)	20mg/Nm^3
Waste		Mercury (Hg)	$0.001mg/Nm^3$
		Lead (Pb)	$0.01 \mathrm{mg/Nm^3}$

Part II

STANDBY GENERATORS

Fuel	Rated Output Capacity	Type of Pollutant	Emission Limit
Gasoline, kerosene diesel or	Any	Particulate Matter (PM), Sulfur Dioxide (SO ₂), Nitrogen Oxides (NO _x)	Shall be controlled by stack height and fuel quality as set out in Regulations 11 and 12
heavy oil		Smoke	10% Opacity

Part III

BOILERS

Fuel	Rated Output Capacity (C)	Type of Pollutant	Emission Limit
Oil	of steam/hour Sulfur Dioxide (SO ₂), Nitrogen Oxides (NO _x)		Shall be controlled by fuel quality and stack height as set out in Regulations 11 and 12 20% Opacity
	C≥2 metric tons	Smoke Sulfur Dioxide (SO ₂) Nitrogen Oxides (NO _x)	Shall be controlled by fuel quality and stack height as set out in Regulations 11 and 12
	of steam/hour	Smoke Particulate Matter (PM)	15% Opacity 100mg/Nm³
	C<2 metric tons of steam/hour	Particulate Matter (PM) Nitrogen Oxides (NO _x) Smoke	Shall be controlled by stack height as set out in Regulations 11 20% Opacity
Bio mass	C≥2 metric tons	Nitrogen Oxides (NO _x)	Shall be controlled by stack height as set out in Regulations 11
	of steam/hour	Smoke Particulate Matter (PM)	15% Opacity 200mg/Nm³
Coal	C<2 metric tons of steam/hour	Particulate Matter (PM), Sulfur Dioxide (SO ₂), Nitrogen Oxides (NO _x) Smoke	Shall be controlled by fuel quality stack height as set out in Regulations 11 and 12 20% Opacity
	C≥2 metric tons of steam/hour	Nitrogen Oxides (NO _x) Sulfur Dioxide (SO ₂) Smoke	500mg/Nm³ 850mg/Nm³ 20% Opacity
		Particulate Matter (PM)	150mg/Nm ³

Part IV

THERMIC FLUID HEATERS

Fuel	Rated Output Capacity (C)	Type of Pollutant	Emission Limit	
Oil	C<5000		Shall be controlled by fuel quality and stack height as set out in Regulations 11 and 12	
	C>5000	Smoke Sulfur Dioxide (SO ₂) Nitrogen Oxides (NO ₂)	20% Opacity Shall be controlled by fuel quality and stack height as set out in Regulations 11 and 12	
	MJ/hour	Smoke Particulate Matter (PM)	15% Opacity 100mg/Nm³	
	C<5000 MJ/hour	Particulate Matter (PM), Nitrogen Oxides (NO _x)	Shall be controlled by stack height as set out in Regulations 11	
Biomass	C≥5000	Smoke Nitrogen Oxides (NO _x)	20% Opacity Shall be controlled by stack height as set out in Regulations 11	
	MJ/hour	Smoke Particulate Matter (PM)	15% Opacity 200mg/Nm³	
	C<5000 MJ/hour	Particulate Matter (PM), Sulfur Dioxide (SO ₂), Nitrogen Oxides (NO _x)	Shall be controlled by fuel quality and stack height as set out in Regulations 11 and 12	
Coal		Smoke	20% Opacity	
	C≥5000 MJ/hour	Nitrogen Oxides (NO _x) Sulfur Dioxide (SO ₂)	500mg/Nm ³ 800mg/Nm ³	
		Smoke Particulate Matter (PM)	20% Opacity 150mg/Nm³	

Part V

INCINERATORS

Rated Output Capacity (C)	Type of Pollutant	Emission Limit	
	Sulfur Dioxide (SO ₂)	70mg/Nm^3	
	Nitrogen Oxides (NO _x)	$400 \mathrm{mg/Nm^3}$	
	Particulate Matter (PM)	150mg/Nm ³	
	Smoke	20% Opacity	
C< 1 Metric Ton/Hour	Carbon Monoxide (CO)	50mg/Nm ³	
	Hydrogen Chloride (HCl)	20mg/Nm^3	
	Mercury (Hg)	$0.01 \mathrm{mg/Nm^3}$	
	Lead (Pb)	$0.05 \mathrm{mg/Nm^3}$	
	Dioxin and Furans	Shall be controlled by temperature and retention time as set	
		out in Regulation 14	
	Sulfur Dioxide (SO ₂)	70mg/Nm³	
	Nitrogen Oxides (NO _x)	$300 \mathrm{mg/Nm^3}$	
	Particulate Matter (PM)	$100 \mathrm{mg/Nm^3}$	
C≥ 1 Metric Ton/Hour	Smoke	10% Opacity	
	Carbon Monoxide (CO)	50mg/Nm ³	
	Hydrogen Chloride (HCl)	15mg/Nm^3	
	Mercury (Hg)	$0.001\mathrm{mg/Nm^3}$	
	Lead (Pb)	0.01mg/Nm^3	
	Dioxin and Furans	Shall be controlled by temperature and retention time as set	
		out in Regulation 14	
	Sulfur Dioxide (SO ₂)	70mg/Nm^3	
	Nitrogen Oxides (NO _x)	300mg/Nm^3	
	Particulate Matter (PM)	$100 \mathrm{mg/Nm^3}$	
	Smoke	10% Opacity	
Any Infected waste	Carbon Monoxide (CO)	50mg/Nm ³	
Incinerators	Hydrogen Chloride (HCl)	15mg/Nm³	
	Mercury (Hg)	$0.001\mathrm{mg/Nm^3}$	
	Lead (Pb)	$0.01 \mathrm{mg/Nm^3}$	
	Dioxin / Furans	Shall be controlled by temperature and retention time as set out in Regulation 14	

Part VI

CUPOLAS, BLAST FURNACES, COKE OVENS, BASIC OXYGEN FURNACES, ELECTRIC INDUCTION & ELECTRIC ARC FURNACES

Rated Output Capacity (C)	Type of Pollutant	Emission Limit
Any	Particulate Matter (PM)	150mg/Nm^3
	Sulfur Dioxide (SO ₂)	800mg/Nm^3
	Nitrogen Oxides (NO _x)	500mg/Nm³
	Smoke	20% Opacity

Part VII

CEMENT KILNS

Rated Output	Type of Pollutant	Emiss	ion Limit
Capacity (C)		Existing *	New **
Any	Particulate Matter (PM)	400mg/Nm ³	200mg/Nm ³
	Sulfur Dioxide (SO ₂)	540mg/Nm³	$270mg/Nm^3\\$
	Nitrogen Oxides (NO _x)	1250mg/Nm ³	$1000 mg/Nm^3$
	Smoke	20% Opacity	20% Opacity

^{*} Cement kilns in existence prior to the date of operation of these regulations.

^{**} Cement kilns which will commence operation after the date of operation of these regulations.

(Regulations 3 and Regulation 15)

SCHEDULE III

Pollutant Based Standards

Part I

Pollutant	Process/Source	Emission Limit Combustion	Emission Limit Non - Combustion
Particulate Matters (PM)	Any	150mg/Nm^3	$100 mg/Nm^3$
Smoke	Any	25% Opacity	25% Opacity
Carbon Monoxide (CO)	Any	900mg/Nm ³	1100mg/Nm ³
Sulfur Dioxide (SO ₂)	Sulfuric acid manufacturing plants Any Other	2kg/Metric ton of Sulf	furic acid production 800mg/Nm³
Nitrogen Oxides (NO _x)	Nitric acid manufacturing plants Any Other	1.5kg/Metric ton of Ni 500mg/Nm ³	
Total Volatile Organic Compounds (TVOC)	Any	20ppm	10ppm

PART II

Pollutant	Process/Source	Emission Limits/Combustion or Non - Combustion
Chlorine (Cl ₂)	Any	Chlorine 35mg/Nm ³
Hydrogen Chloride (HCL)	Hydrochloric acid manufacturing plants	0.8 kg per Metric ton of Hydrochloric acid production
	Any other	Hydrogen Chloride 50mg/Nm ³
Fluorine (F ₂)	Any	Fluorine 20mg/Nm ³
Fluoride (F ⁻)	Phosphate Industry	0.18 kg/Metric ton of raw material feed
(Hydrogen or Silicon)	Any Other	Hydrogen Fluoride 2mg/Nm ³
Hydrogen Sulfide (H ₂ S)	Any	$1 \mathrm{mg/Nm^3}$
Cadmium or its compounds	Any	1mg/Nm³ as Cd
Lead or its compounds	Lead Smelling	0.2mg/Nm³ as Pb
	Any Other	0.2mg/Nm³ as Pb
Antimony or its compounds	Any	0.5mg/Nm³ as Sb
Arsenic or its compounds	Any	0.1mg/Nm³ as As
Copper or its compounds	Copper smelling	1mg/Nm³ as Cu
	Any Other	1mg/Nm³ as Cu
Zinc or its compounds	Any	1mg/Nm³ as Zn
Mercury or its compounds	Any	0.01mg/Nm³ as Hg
Dioxin/Furan	Any	2mg/Nm ³
Ammonia	Any	$10 mg/Nm^3$

(Regulation 4)

SCHEDULE IV

Fugitive Dust Emission Standards

The difference between two simultaneous 3 hour Total Suspended Particulate Matter (TSPM) measurements (gravimetric) carried out on up-wind and down-wind basis from any process area or emission area shall not be greater than 450µg/m³.

- a. Measurement location shall be within 10 meters from any process equipment or emission area towards upwind and down wind directions.
- b. The wind direction shall be the most predominant wind direction during the time period of measurement.
- c. Any method approved by the Authority shall be used for the TSPM measurement.

(Regulation 4)

SCHEDULE V

Fugitive Non-Methane Volatile Organic Compounds (NMVOC) Emission Standards

The difference between two simultaneous Non-Methane Volatile Organic Compound measurements carried out on upwind and down - wind basis from any process area which emits volatile organic compounds shall not be greater than 5ppm.

- a. The measurement location shall be within 5 meters from any process equipment or emission area towards up wind and down wind directions.
- b. The wind direction shall be the most predominant wind direction the time period of measurement.
- c. Any method approved by the Authority shall be used for the determination of Non-Methane Volatile Organic Compounds.

(Regulation 4)

SCHEDULE VI

Fugitive Acid Mist and Ammonia Emission Standards

Fugitive acid mists or fugitive ammonia mist emissions from any process area shall not be greater than 20mg/m³. The measurement location shall be within 5 meters down-wind from the process area. Sampling time period shall be 3 hours at the sampling flow rate 1 liter/min. Any method approved by the Authority shall be used for the determination of fugitive acid mist and ammonia mist emission level.

(Regulation 4)

SCHEDULE VII

Asbestos Fiber Emission Standards

Ambient asbestos fiber concentrations in process area shall not be greater than 1 fibre/m³. The measurement location shall be within 20 meters down - wind from the process area. Any method approved by the Authority shall be used for the determination of asbestos fiber concentration.

(Regulation 8)

SCHEDULE VIII

Reference Oxygen Levels

Fuel Type	Reference Oxygen Level
Liquid and gaseous fuels	03%
Solid fuels	06%

06- 44