

Module 5 EQA 1974

Air Quality under EQA 1974

**Related Regulations on Air Quality &
Environmental Quality (Clean Air)
Regulations 2014**



E i M A S
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OUTLINE OF PRESENTATION

1. Sources That Subjected to Clean Air Regulations
2. Introduction Clean Air Regulation, 2014
3. Emission Standards & Ambient Air Quality Guideline
4. Written Notification Forms
5. Other Related Regulations on Air Quality



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Objective

At the end of this module, you should be able

- briefly describe the overall provision in the Environmental Quality (Clean Air) Regulations 2014
- Recognize the sources that subjected to written notification
- Recognize various emission standards
- Explain the written approval application procedure and approval conditions.
- Recognize other related regulations, guidelines and Malaysian Standards on air quality



1. Sources subjected to Clean Air Regulations

- ◆ What needs written approval/notification?
 - chimney, vents, opening, etc through which air pollutants will be discharged.
 - fuel burning equipment
 - incinerators
 - generators

- ◆ The application for the above would include air pollution control equipment



- ◆ The approval condition (KB) may include:
 - chimney height; control equipment specifications, operating conditions, maintenance and record keeping, etc.



Definition of chimney

- ◆ “Chimney” includes any structure, opening, vent, flue, conduit, outlet or any structure constructed or arranged from or through which air pollutants may emit, and any reference to a chimney which serves the whole or a part of the facilities though structurally separate from such facilities or building thereon



Definition of fuel burning equipment

- ◆ “fuel burning equipment” means any furnace, boiler, fireplace, oven, retort, internal combustion engine, vessel, or any other apparatus, device, mechanism, stack, chimney or structure used in connection with the burning of any combustible material;



CAR 2014 vs CAR 1978

Number of Regulations & Schedules

2014

30 Regulations

6 Schedules

1978

59 Regulations

5 Schedules



COMPLIANCE SCHEDULE SUBJECT TO ACTIVITY

ACTIVITY	COMPLIANCE SUBJECT TO SCHEDULE
All premises - General standard emission	SECOND SCHEDULE
Specific standard for specific industry - 11 specific industries (Table A – K)	THIRD SCHEDULE
Toxicity equivalents factor (TEFs) for dioxin and furan	FOURTH SCHEDULE
Emission Standards For Hazardous Substances - 6 Categories (Category 1 – 6)	FIFTH SCHEDULE
List of Undesirable Occurrence	SIXTH SCHEDULE



FORMS AND SUPPORTING DOCUMENTS

NO	DOCUMENT / FORMS	RELATED REGULATIONS
1	Form: Written Notification of Air Emission Sources	5(2)
2	Guidance Document :Best Available Techniques Economically Achievable (BAT)	6
3	Guidance Document : Design and Operation of Air Pollution Control System	7(1)
4	Form : Written Declaration On Design And Construction Of Air Pollution Control System	7(4)
5	Document : List of Hazardous Substances	15(2)
6	Guidance Document : Performance Monitoring of Air Pollution Control System	9(a)
7	Guidance Document : Installation and Maintenance of Continuous Emission Monitoring System (CEMS)	17 (2)
8	Form: Emission Declaration Of Air Emission Sources	19(1)
9	Guidance Document : Fugitive Emission Control	Second Schedule
10	Guidance Document : Leak Detection and Repair	3-E



REGULATION 4(1)

OBLIGATION TO COMPLY

NEW PREMISES

Premises purchased or acquired on or after the date CAR 2014 come into operation

COMPLIANCE

Comply with the limit values and technical standards specified in CAR 2014

EXISTING PREMISES

Existing premises or premises in operation before CAR 2014 come into operation

COMPLIANCE

5 years period after CAR 2014 come into operation

PREMISES WITH COMPLAINTS

Existing premises with justified complaint or evidence of nuisance

COMPLIANCE

Director General may serve upon the owner or occupier a notice in writing requiring complying to the CAR 2014. The 5 years grace period is not applicable for these cases



REGULATION 5

OBLIGATION TO NOTIFY

AS/PUB/N-CHIMNEY

PEMBERITAHUAN BERTULIS PEMASANGAN EKZOS/ SISTEM PENGUDARAAN
[Peraturan 5(2)]
WRITTEN NOTIFICATION ON INSTALLATION OF EXHAUST/ VENT
[Regulation 5(2)]

Sila tanda (✓) pada kotak yang berkaitan
Please tick (✓) in appropriate box

(a) Pembinaan baru
New construction ☐

(b) Menaik taraf sistem sedia ada
Upgrade of existing system ☐

Perhatian/Attention.

- Sila penuhkan borang dengan jelas dan bertaip. Setiap borang untuk satu alat ekzos/ sistem pengudaraan.
Please fill in the form clearly and type. Each form for each exhaust/ vent.
- Borang dan semua maklumat hendaklah dijilidkan dalam fail yang sesuai untuk dikemukakan ke Jabatan ini.
Preferably, forms and all relevant information should be presented in a suitable folder for submission to the Department.

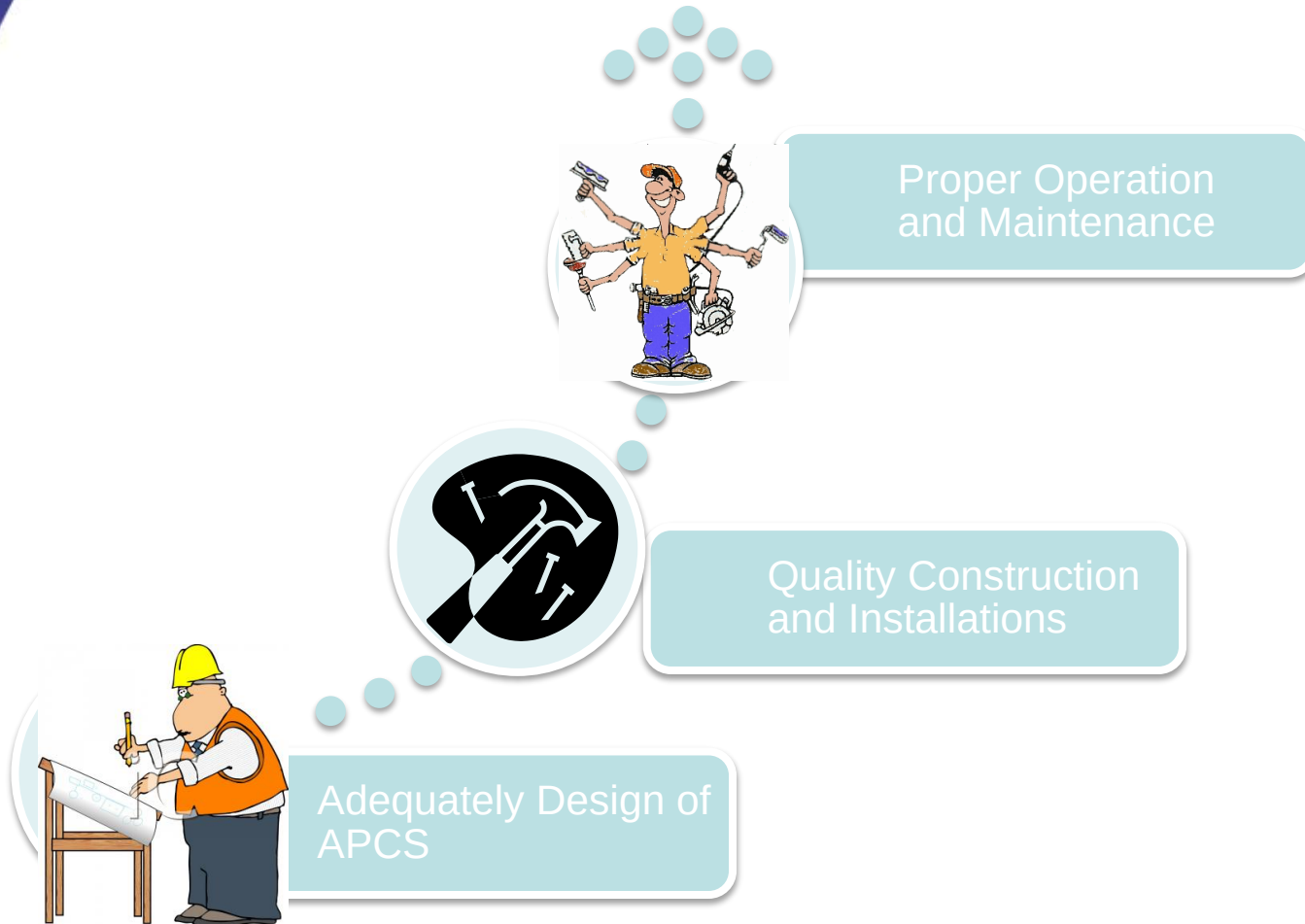
A. MAKLUMAT ASAS PEMBERITAHUAN
GENERAL INFORMATION FOR NOTIFICATION

1. <u>Nama dan alamat pemunya/pemohon</u> : Name and address of applicant: _____ _____ _____	2. <u>Nama dan alamat pembuat/perunding</u> Name and address of manufacturer/consultant _____ _____ _____
3. <u>Pegawai syarikat yang boleh dihubungi</u> (Contact person) _____	4. <u>Pembuat/Perunding yang boleh dihubungi</u> (Contact person) _____
5. No. <u>Telefon</u> (tel. no.): _____ No. <u>Telefon Bimbit</u> (H/p No.): _____ No. <u>Faks</u> (Fax no.): _____ E-mel (E-mail): _____	6. No. <u>Telefon</u> (tel. no.): _____ No. <u>Telefon Bimbit</u> (H/p No.): _____ No. <u>Faks</u> (Fax no.): _____ E-mel (E-mail): _____
7. <u>Alamat pemasangan (jika lain dari di atas)</u>	8. <u>Jenis pengeluaran kilang (jika berkaitan)</u> :

- All activities should be notified in writing.
- Notification should be made 30 days before any commencement of work. →



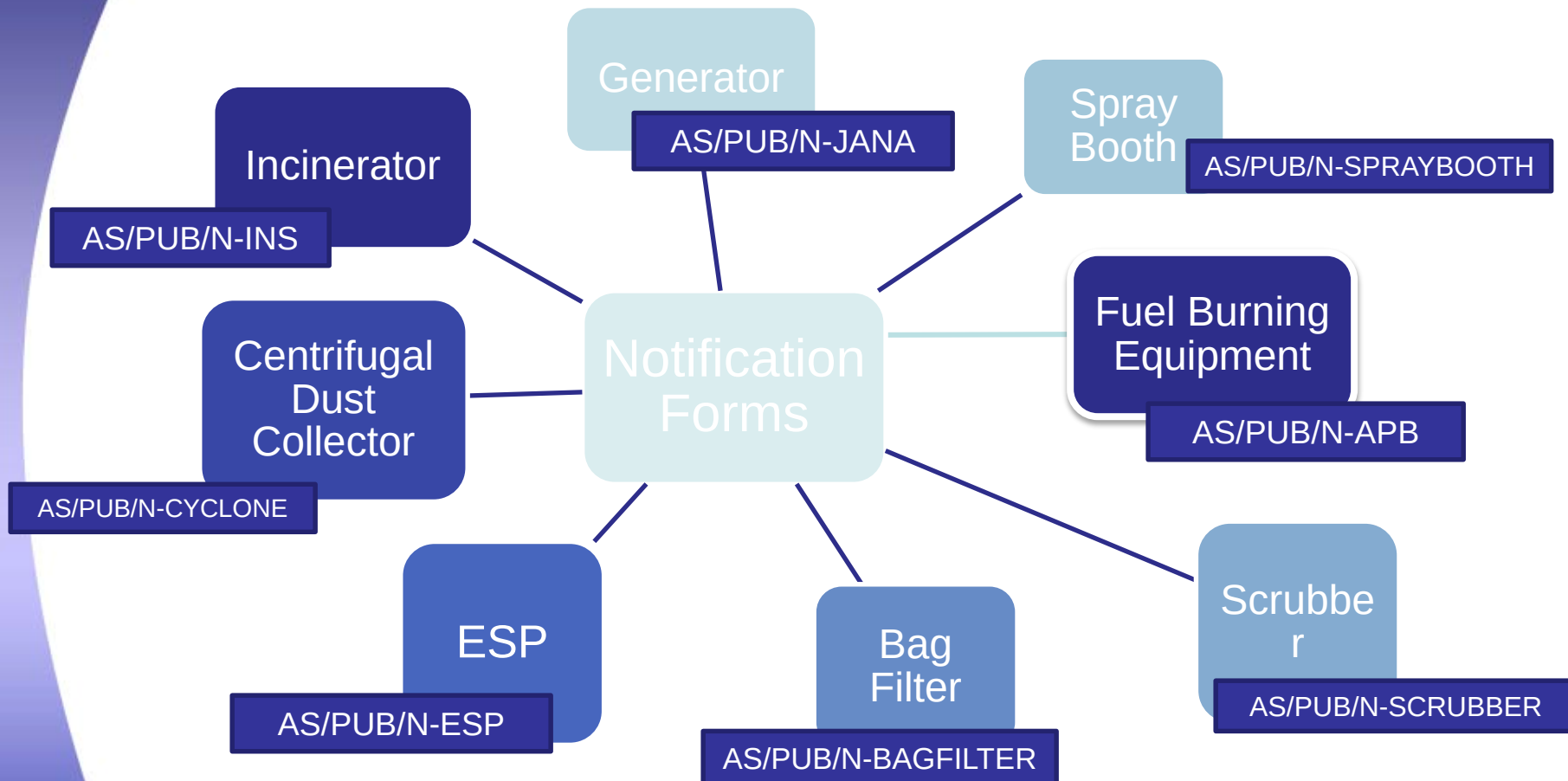
Pre-requisite for successful Air Pollution Control Systems





REGULATION 5

OBLIGATION TO NOTIFY





REGULATION 6

MEASURES TO REDUCE EMISSION

INDUSTRY LISTED IN THE 1ST SCHEDULE
(CAR 2014)



BAT DOCUMENTS

BAT
best
techniques
and
effective
way to
prevent and
reduce
pollution

- Size, design and operating characteristics of the plant or the latest process
- Selection of raw material or fuel
- Implementation of the 3R concept
- Other processes within the plant design capacity & capability
- Other way of operating or setting within the plant design capacity & capability
- Proper handling & monitoring
- Efficient and continuous maintenance of a plant & equipment
- Reasonable economic & cost factors



REGULATION 7(4) AIR POLLUTION CONTROL SYSTEM

- Sound Engineering Practices
 - To ensure that all components of APCS are in good working condition.
- Specification as in Guidance Document for Fuel Burning Equipments and Air Pollution Control Systems (GD APCS) →
- 30 days after premises start operation :
 1. Written declaration
 2. As-built drawing

AS/PUB/DECLARE



AKUAN BERTULIS MENGENAI REKA BENTUK DAN PEMBINAAN SISTEM
KAWALAN PENCEMARAN UDARA
[Peraturan 7(5)]

WRITTEN DECLARATION ON DESIGN AND CONSTRUCTION OF AIR POLLUTION
CONTROL SYSTEM
[Regulation 7(3)]

Nama premis :
Name of premise :

Alamat premis :
Address of premise :

No. rujukan JAS (jika berkenaan) :
DOE reference number (if applicable) :

No. telefon : No. Faks :
Telephone number : Fax number :

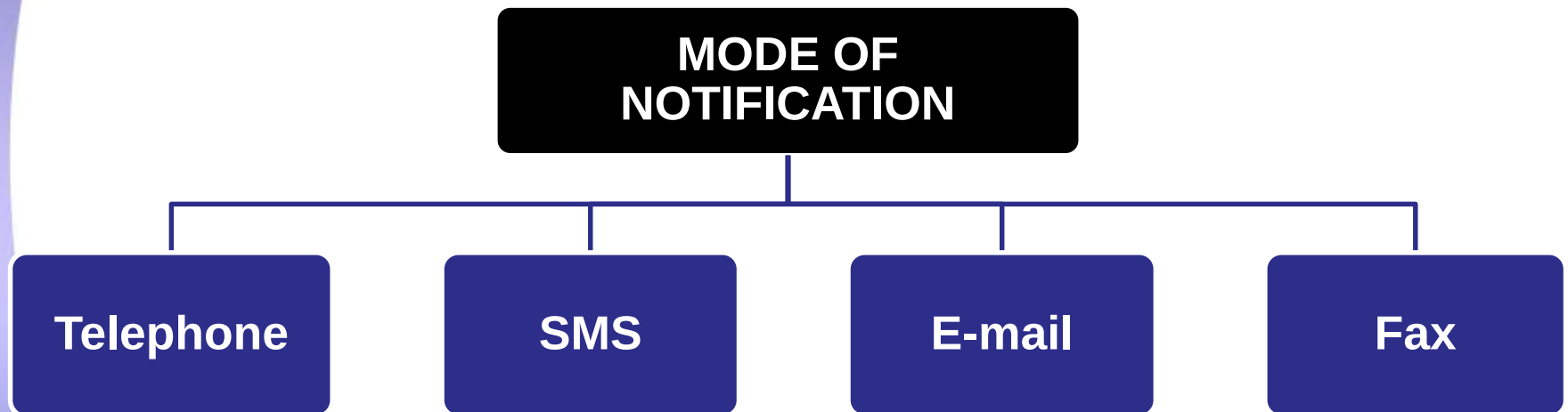
Kami seperti nama di bawah, dengan ini mengaku bahawa sistem kawalan pencemaran udara yang telah direka bentuk dan dibina telah mematuhi keperluan dan spesifikasi minimum sebagaimana digariskan dalam Dokumen Panduan Mengenai Reka Bentuk dan Pembinaan Sistem Kawalan Pencemaran Udara yang ditetapkan oleh Ketua Pengarah Kualiti Alam Sekeliling.

We the undersigned hereby declare that the air pollution control system has been designed and constructed in strict compliance with the minimum requirements and specifications as outlined in the Guidance Document on the Design and Construction of Air Pollution Control System as specified by the Director General of Environmental Quality



REGULATION 8 FAILURE IN OPERATIONS OF AIR POLLUTION CONTROL SYSTEM

The DG should be notified not later than 1 hour.





REGULATION 9: PERFORMANCE MONITORING OF AIR POLLUTION CONTROL SYSTEM

Refer Guidance Document Performance Monitoring of Air Pollution Control System

REGULATION 10: MAINTENANCE OF RECORDS

Records to be kept for 3 years, including:

- Manufacturing processes
- Maintenance and performance monitoring of the APCS

REGULATION 11: CHANGE OF OCCUPANCY

Conditions and restrictions of license shall be binding right after change of occupancy



REGULATION 12 OPACITY

Regulation 12(1)

Not darker
than shade No
1 Ringelmann
Chart

Not greater than 20%
opacity
Transmissiometer (1
minute averaging
time)

Regulation 12(2)

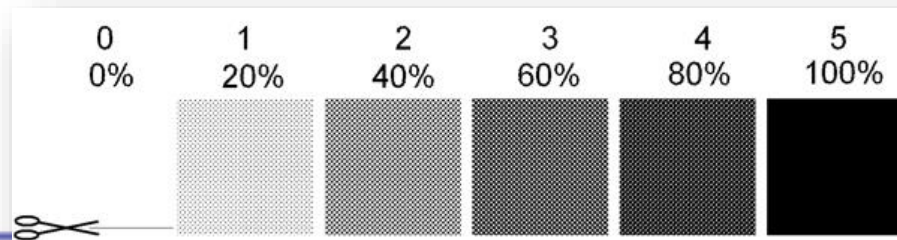
12(2)(a) No 2 Ringelmann
Chart in 5 minutes
aggregate within 1 hour
period

12(2)(a) No 2 Ringelmann
Chart in 15 minutes
aggregate within 24 hours
period

12(2)(b) At Start-up
No 2 Ringelmann Chart

Regulation 12(3)

Premis emitting $\geq$
2.5 kg/hour dust
or potentially
emitting smoke
darker than No 2
Ringelmann Chart
shall operate a
transmissiometer
(averaging time: 1
minute)





Standard???

- ◆ Emission standard (had pengeluaran)
- ◆ Technology standard
- ◆ Operating standard



Konsep Standard dalam Peraturan Udara Bersih

- ◆ Emission standard (had pengeluaran)
 - Had spesifik mengikut sektor contoh habuk 150 mg/m³
- ◆ Technology standard
 - Dinyatakan dalam dokumen BAT, Guidance Document Design of Fuel Burning Document and Air Pollution Control System
- ◆ Operating standard
 - Dokumen pengawasan prestasi Alat Kawalan Pencemaran Udara



REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

All industries under 1ST Schedule must comply to standards in 2nd & 3rd Schedule

1. Heat and Power Generation
2. Production and Processing of Ferrous Metals (Iron and Steel Mills)
3. Ferrous Metal Foundries
4. Production and Processing of Non-Ferrous Metals
5. Oil and Gas industry
6. Non-Metallic (Mineral) Industry : All sizes cement
7. Asphalt Mixing Plant (Stationary Installations)
8. Pulp and Paper Industry
9. Chemical and Petrochemical Industry
10. Solvent Use in Industry
11. Waste Incinerators



REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Fuel Burning Equipment (FBE) using:-

- pulverized fuel
- any solid fuel ≥ 30 kg/hr
- any liquid or gaseous matter ≥ 15 kg/hr

have to comply with the standards specified in 2nd Schedule.



REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Second (2nd) Schedule

(I) Control of fuel burning equipment, incinerators and crematoria

1. Control of fuel quality for fuel burning equipment and incinerators not covered by the First Schedule:

Fuel type	Fuel	Fuel quality parameter
Liquid	All	Sulphur content < 500 ppm (per weight)
Solid	Coal	Sulphur content < 1% (per weight)
	Biomass	Wood, agricultural waste, etc.: air dry and in its natural composition (e.g. wood without coating, paint or other treatment)
		Residues from wood-based industries: without wood preservatives



REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Second (2nd) Schedule

2. Combustion emissions from fuel burning equipment and incinerators not covered by the First Schedule:

CO₂ reference content is 12%

Fuel type	Pollutant	Limit value	Monitoring
Liquid	Total particulate matter (PM) Where dust load emitted : a) $> 0.33 < 1.0$ kg/h b) ≥ 1.0 kg/h	50 mg/m ³	Once/year 2 times/year
	Total particulate matter (PM) Where dust load emitted : a) $> 0.44 < 1.0$ kg/h b) $\geq 1.0 < 1.5$ kg/h c) $\geq 1.5 < 2.0$ kg/h d) $\geq 2.0 < 2.5$ kg/h e) ≥ 2.5 kg/h		Once/year 2 times/year 3 times/year 4 times/year Continuous*
Solid	Carbon monoxide (CO)	1000 mg/m ³	Periodic

* Averaging time for continuous monitoring is 30 minutes



REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Second (2nd) Schedule

Control of NMVOC Emission

◆ Outlets

- Halogenated hydrocarbons – 20 mg/m³
- Others – 150 mg/m³

Control of Fugitive Emissions

- ◆ Refer Guidance Document of Fugitive Emission Control



REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Third (3rd) Schedule

- i. 2nd Schedule limits applies to all industries if not specified in 3rd Schedule;
- ii. Specific industry in the title;
- iii. Capacities are stipulated in the title;
- iv. Percentage of O₂ or CO₂ reference content differ base on process and industry;
- v. Limit values are normalized;
- vi. Monitoring type: Periodic or Continuous; and
- vii. “Note” at the bottom of each sub-table is important

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

3rd SCHEDULE



HEAT AND POWER GENERATION

MW_e = electrical power

1. Boiler

O₂ reference content is 6% for solid fuels and 3% for others.

Fuel type	Pollutant	Capacity	Limit value	Monitoring
Solid and liquid fuels	Sum of SO ₂ and SO ₃ , expressed as SO ₂	> 10 MW _e	500 mg/m ³	Continuous*
	Sum of NO and NO ₂ expressed as NO ₂	> 10 MW _e	500 mg/m ³	Continuous*
	Hydrogen chloride (HCl)	> 10 - <100 MW _e	200 mg/m ³	Periodic
	Hydrogen chloride (HCl)	≥100 MW _e	100 mg/m ³	Periodic
	Hydrogen fluoride (HF)	> 10 - <100 MW _e	30 mg/m ³	Periodic
	Hydrogen fluoride (HF)	≥100 MW _e	15 mg/m ³	Periodic
	Carbon monoxide (CO)	> 10 MW _e	200 mg/m ³	Continuous*
	Total PM	> 10 MW _e	50 mg/m ³	Continuous*
	Mercury (Hg)	>10 MW _e	0.03 mg/m ³	Periodic
	PCDD/PCDF	> 10 MW _e	0.1 ng TEQ/m ³	Periodic
Gaseous fuels	Sum of NO and NO ₂ expressed as NO ₂	> 10 MW _e	350 mg/m ³	Continuous*
	Carbon monoxide (CO)	> 10 MW _e	50 mg/m ³	Continuous*
	Total PM	> 10 MW _e	5 mg/m ³	Periodic

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

2. Combustion turbines

O₂ reference content is 15%.

Fuel type	Pollutant	Capacity at ISO conditions	Limit value	Monitoring
Gaseous fuels	Sum of NO and NO ₂ expressed as NO ₂	> 10 MW _e	150mg/m ³	Continuous*
	Carbon monoxide (CO)	> 10 MW _e	100 mg/m ³	Continuous*
Liquid fuels	Sum of NO and NO ₂ expressed as NO ₂	> 10 MW _e	200 mg/m ³	Continuous*
	Carbon monoxide (CO)	> 10 MW _e	100 mg/m ³	Continuous*

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

3. Generator sets for combined heat and power production with a total thermal output $\geq 3 \text{ MW}_e$:

O₂ reference content is 5%.

Fuel type	Pollutant	Capacity	Limit value	Monitoring
Liquid or gas fuels	Sum of NO and NO ₂ expressed as NO ₂	$\geq 3 \text{ MW}_e$	600mg/m ³	Periodic
	Carbon monoxide (CO)	$\geq 3 \text{ MW}_e$	650 mg/m ³	Periodic
	Total PM	$\geq 3 \text{ MW}_e$	80 mg/m ³	Periodic

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

B

PRODUCTION AND PROCESSING OF FERROUS METALS (IRON AND STEEL MILLS)

Source	Pollutant	Limit value	Monitoring
Sinter plants (waste gas from the sintering belt)	Sum of SO ₂ and SO ₃ , expressed as SO ₂	500mg/m ³	Continuous*
	Sum of NO and NO ₂ expressed as NO ₂	400 mg/m ³	Continuous*
	Total PM	50 mg/m ³	Continuous*
	Total lead as Pb	1 mg/m ³	Periodic
	NMVOC	75 mg/m ³	Periodic
	PCDD/PCDF	0.1 ng TEQ/m ³	Periodic
Coke ovens (@ 5% O ₂)	Total PM	10 mg/m ³	Continuous*
	Sum of NO and NO ₂ expressed as NO ₂	500 mg/m ³	Periodic
	Sulphur compounds as S	800 mg/m ³	Periodic
Blast furnace (Regenerator; @ 3% O ₂)	Total PM	50 mg/m ³	Continuous*
Basic oxygen furnace (converter gas)	Total PM	50 mg/m ³	Continuous*
Electric arc furnaces	Total PM	50 mg/m ³	Continuous*
Rolling mill: Thermal treatment furnace (@ 5% O ₂)	Sum of NO and NO ₂ expressed as NO ₂	500 mg/m ³	Periodic

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

C

FERROUS METAL FOUNDRIES WITH A CAPACITY ≥ 1 TON MOLTEN METAL PER DAY

Source	Pollutant	Limit value	Monitoring
Cupola furnace	Sum of SO ₂ and SO ₃ , expressed as SO ₂	500mg/m ³	Periodic
	Carbon monoxide (CO)	150 mg/m ³	Periodic
Core production and casting	Amine	5 mg/m ³	Periodic
	Benzene	5 mg/m ³	Periodic

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

D

PRODUCTION AND PROCESSING OF NON-FERROUS METALS WITH A CAPACITY ≥ 0.5 TONS PER DAY FOR LEAD OR CADMIUM OR ≥ 2 TONS PER DAY FOR OTHER METALS

Source	Pollutant	Limit value	Monitoring
Sinter plants (waste gas from the sintering belt)	Sum of SO ₂ and SO ₃ , expressed as SO ₂	500mg/m ³	Continuous*
	Sum of NO and NO ₂ expressed as NO ₂	400 mg/m ³	Continuous*
	Total PM	50 mg/m ³	Continuous*
	Total lead as Pb	1 mg/m ³	Periodic
	NMVOC	75 mg/m ³	Periodic
	PCDD/PCDF	0.1 ng TEQ/m ³	Periodic
Production of copper and zinc	Total PM	20 mg/m ³	Continuous*
Production of lead	Total PM	10 mg/m ³	Continuous*
Primary aluminium	Total PM	10 mg/m ³	Continuous*
	Fluorine compounds as HF	1 mg/m ³	Periodic
	Total Fluoride	1.5 mg/m ³	Periodic
	Sum of SO ₂ and SO ₃ , expressed as SO ₂	100 mg/m ³	Continuous*

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Source	Pollutant	Limit value	Monitoring
Secondary aluminium ¹⁾	Total PM	10 mg/m ³	Continuous*
	Sum of NO and NO ₂ expressed as NO ₂	500 mg/m ³	Periodic
Smelting, alloying and refining of aluminium ²⁾	Total PM	10 mg/m ³	Continuous*
Smelting, alloying and refining of other non-ferrous metals	Total PM	5 mg/m ³	Continuous*

* Averaging time for continuous monitoring is 30 minutes

¹⁾ In secondary aluminium production, hexachloroethane shall not be used for smelting. "Secondary aluminium" is defined as re-melting of all kinds of used aluminium end products which might be coated, painted, and laminated.

²⁾ "Smelting, alloying and refining of aluminium" is defined as melting of pure aluminium and plain scrap.

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

E

*OIL AND GAS INDUSTRIES: REFINERIES
(ALL SIZES); NATURAL GAS PROCESSING
AND STORAGE; STORAGE AND
HANDLING OF PETROLEUM PRODUCTS*

Source	Pollutant	Limit value	Monitoring
Claus plant	Sulphur	Recovery > 95%	Periodic
Catalytic cracking	Total PM	40 mg/m ³	Continuous*
	Sum of SO ₂ and SO ₃ , expressed as SO ₂	1200 mg/m ³	Continuous*
Calcination	Total PM	40 mg/m ³	Continuous*

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

F

NON-METALLIC (MINERAL) INDUSTRY: CEMENT PRODUCTION (ALL SIZES); MANUFACTURE OF GLASS INCLUDING GLASS FIBRE WITH A MELTING CAPACITY ≥ 1 TON OF PRODUCT PER DAY; MANUFACTURE OF CERAMIC PRODUCTS BY FIRING, ROOFING TILES, BRICKS, REFRACTORY BRICKS, TILES, CERAMIC GLASS, STONEWARE OR PORCELAIN, WITH A PRODUCTION CAPACITY ≥ 10 TONS OF PRODUCT PER DAY

O₂ reference content for:

- a) cement kilns is 10%
- b) flame-heated glass melting furnaces is 8%
- c) flame-heated pot furnaces and day tanks furnaces 13 %
- d) ceramic furnaces is 17%

Source	Pollutant	Limit value	Monitoring
Cement kilns	Sum of NO and NO ₂ expressed as NO ₂	800 mg/m ³	Continuous*
	Total PM	50 mg/m ³	Continuous*
	Mercury	0.05 mg/m ³	Periodic
	PCDD/PCDF	0.1 ng TEQ/m ³	Periodic
Rotary furnaces for the manufacture of hard quicklime or sintering dolomite	Sum of NO and NO ₂ expressed as NO ₂	1500 mg/m ³	Continuous*
	Total PM	50 mg/m ³	Continuous*
	Mercury	0.05 mg/m ³	Periodic
	PCDD/PCDF	0.1 ng TEQ/m ³	Periodic

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Source	Pollutant	Limit value	Monitoring
Glass furnaces	Sum of SO ₂ and SO ₃ , expressed as SO ₂	800 mg/m ³	Continuous*
	Sum of NO and NO ₂ expressed as NO ₂	800 mg/m ³	Continuous*
	Total lead as Pb	5 mg/m ³	Periodic
	Total PM	50 mg/m ³	Continuous*
Ceramic furnaces	Sum of SO ₂ and SO ₃ , expressed as SO ₂	800 mg/m ³	Periodic
	Sum of NO and NO ₂ expressed as NO ₂	800 mg/m ³	Periodic
	Total PM	50 mg/m ³	Once/year 2 times/year
	Where dust load emitted : a) > 0.33 < 1.0 kg/h b) ≥ 1.0 < 2.0 kg/h c) ≥ 2.0 kg/h		Continuous*

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

G

ASPHALT MIXING PLANTS (STATIONARY INSTALLATIONS)

O₂ reference content is 17%.

Fuel type	Pollutant	Limit value	Monitoring
Liquid and gaseous	Carbon monoxide (CO)	0.50 g/m ³	Periodic
Solid	Carbon monoxide (CO)	1.0 g/m ³	Periodic
All fuels	Total PM	50mg/m ³	Periodic
	NMVOC	50 mg/m ³	Periodic

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

H

PULP AND PAPER INDUSTRY INCLUDING PAPER RECYCLING FACILITIES IN ALL SIZES

Source	Pollutant	Limit value	Monitoring
Recovery furnaces	PM	150 mg/m ³	Periodic
	Sum of NO and NO ₂ expressed as NO ₂	2 kg/t Air Dried Pulp (ADP)	Periodic
Lime kilns	Hydrogen sulfide (H ₂ S)	15 mg/m ³	Periodic
	Sum of NO and NO ₂ expressed as NO ₂	2 kg/t Air Dried Pulp (ADP)	Periodic
Sulfite mills	Total sulfur	1.5 kg/t Air Dried Pulp (ADP)	Periodic
Kraft and others	Total sulfur	1.0 kg/t Air Dried Pulp (ADP)	Periodic

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

1

CHEMICAL AND PETROCHEMICAL INDUSTRY IN ALL SIZES

Pollutant	Limit value	Monitoring
Hydrogen chloride (HCl)	200 mg/m ³	Periodic
Sum of NO and NO ₂ expressed as NO ₂	700 mg/m ³	Periodic
Ammonia (NH ₃)	76 mg/m ³	Periodic
Chlorine (Cl)	32 mg/m ³	Periodic
Sum of SO ₂ and SO ₃ , expressed as SO ₂	100 mg/m ³	Periodic
Mercury (Hg)	0.05 mg/m ³	Periodic
Hydrogen Sulphide (H ₂ S)	7.5 mg/m ³	Periodic
Total PM	50 mg/m ³	Periodic

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

J

SOLVENT USE IN INDUSTRY: FACILITIES FOR THE SURFACE TREATMENT OF SUBSTANCES, OBJECTS OR PRODUCTS USING ORGANIC SOLVENTS, IN PARTICULAR FOR DRESSING, PRINTING, COATING, DEGREASING, WATERPROOFING, SIZING, PAINTING, CLEANING OR IMPREGNATING, FAT EXTRACTION, WITH A SOLVENT CONSUMPTION CAPACITY OF MORE THAN 200 TONNES PER YEAR

1. Facilities of this category shall establish a solvent management plan in order to set-up a reduction strategy.
2. Solvent losses shall be reduced in accordance with Best Available Techniques Economically Achievable limiting these losses to not more than 30% of the solvent input as a general rule.
3. Actual reduction targets and their time frame shall be set on a case-by-case basis as outlined in the Guidance Document on Fugitive Emission Control.

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

K

WASTE INCINERATORS IN ALL SIZES

O₂ reference content is 11%.

Pollutant	Limit value	Monitoring
Total PM	100 mg/m ³	Continuous*
NMVOC as total organic carbon	10 mg/m ³	Continuous*
Hydrogen chloride (HCl)	40 mg/m ³	Continuous*
Hydrogen fluoride (HF)	1 mg/m ³	Continuous*
Sum of SO ₂ and SO ₃ , expressed as SO ₂	50 mg/m ³	Continuous*
Sum of NO and NO ₂ expressed as NO ₂	200 mg/m ³	Continuous*
Carbon monoxide (CO)	50 mg/m ³	Continuous*
Cadmium and its compounds, expressed as cadmium (Cd)	Total	Periodic
Thallium and its compounds, expressed as thallium (Tl)	0.05 mg/m ³	
Mercury and its compounds, expressed as mercury (Hg)	0.05 mg/m ³	Periodic
Antimony (Sb), Arsenic (As), Lead (Pb), Chromium (Cr), Cobalt (Co), Copper (Cu), Manganese (Mn), Nickel (Ni), Vanadium (V), and their compounds expressed as the element	Total 0.5 mg/m ³	Periodic
PCDD/PCDF	43 0.1 ng TEQ/m ³	Periodic

* Averaging time for continuous monitoring is 30 minutes



REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

TOXICITY EQUIVALENTS FACTOR (TEFs) FOR DIOXIN AND FURAN

**Forth (4th)
SCHEDULE**

Chlorine Position		Component	Equivalents Factor
DIOXIN			
(a)	2,3,7,8	Tetraklorodibenzodioksin (TCDD)	1
(b)	1,2,3,7,8	Pentaklorodibenzodioksin (PeCDD)	0.5
(c)	1,2,3,4,7,8	Heksaklorodibenzodioksin (HxCDD)	0.1
(d)	1,2,3,7,8,9	Heksaklorodibenzodioksin (HxCDD)	0.1
(e)	1,2,3,6,7,8	Heksaklorodibenzodioksin (HxCDD)	0.1
(f)	1,2,3,4,6,7,8	Heptaklorodibenzodioksin (HpCDD)	0.01
(g)	1,2,3,4,6,7,8,9	Oktaklorodibenzodioksin (OCDD)	0.001
FURAN			
(a)	2,3,7,8	Tetraklorodibenzofuran (TCDF)	0.1
(b)	2,3,4,7,8	Pentaklorodibenzofuran (PeCDF)	0.5
(c)	1,2,3,7,8	Pentaklorodibenzofuran (PeCDF)	0.05
(d)	1,2,3,4,7,8	Heksaklorodibenzofuran (HxCDF)	0.1
(e)	1,2,3,7,8,9	Heksaklorodibenzofuran (HxCDF)	0.1
(f)	1,2,3,6,7,8	Heksaklorodibenzofuran (HxCDF)	0.1
(g)	2,3,4,6,7,8	Heksaklorodibenzofuran (HxCDF)	0.1
(h)	1,2,3,4,6,7,8	Heptaklorodibenzofuran (HpCDF)	0.01
(i)	1,2,3,4,7,8,9	Heptaklorodibenzofuran (HpCDF)	0.01
(j)	1,2,3,4,6,7,8,9	Oktaklorodibenzofuran (OCDF)	0.001

PERATURAN 13 NILAI BATAS DAN STANDARD TEKNIKAL

BACAAN PENGELUARAN PERLU DINORMALKAN

Contoh :

Bagi loji janakuasa menggunakan bahanapi pepejal, rujukan oksigen adalah 6% dan nilai had pengeluaran NO₂ adalah 500 mg/m³. Jika bacaan yang diukur adalah 490 mg/m³ pada bacaan oksigen 8%, maka bacaan yang diukur perlu *normalized* dengan menggunakan formula berikut:

$$G_N = [G] \times \frac{(20.9 - O_{2,ref})}{(20.9 - O_{2,measured})}$$

O_{2, measured} = O₂ reading, % vol

O_{2, ref} = reference oxygen content, % vol

[G] = measured gas concentration

[G_N] = normalized gas concentration

20.9 = percentage of oxygen in ambient air

$$\begin{aligned} G_N &= [490] \times \frac{(20.9 - 6)}{(20.9 - 8)} \\ &= 566 \frac{mg}{m^3} \end{aligned}$$

Tentukan
rujukan O₂
yang
ditetapkan

PERATURAN 13 NILAI BATAS DAN STANDARD TEKNIKAL

BACAAN PENGELUARAN PERLU DINORMALKAN

Contoh :

Bagi pelepasan daripada peralatan pembakaran bahanapi yang menggunakan bahanapi pepejal, rujukan karbon dioksida adalah 12% dan nilai had pengeluaran jirim zarah (PM) adalah 150 mg/m^3 . Jika bacaan yang diukur adalah 140 mg/m^3 pada bacaan karbon dioksida 8%, maka:

$$G_N = [G] \times \frac{CO_{2,ref}}{CO_{2,measured}}$$

PELEPASAN KARBON MONOKSIDA

$CO_{2, measured} = CO_2 \text{ measured, \% vol}$

$CO_{2, ref} = \text{reference carbon dioxide concentration, \% vol}$

[G]

= measured gas concentration

$[G_N]$

= normalized gas concentration

$$\begin{aligned} G_N &= [140] \times \frac{(12)}{(8)} \\ &= 210 \text{ mg/m}^3 \end{aligned}$$

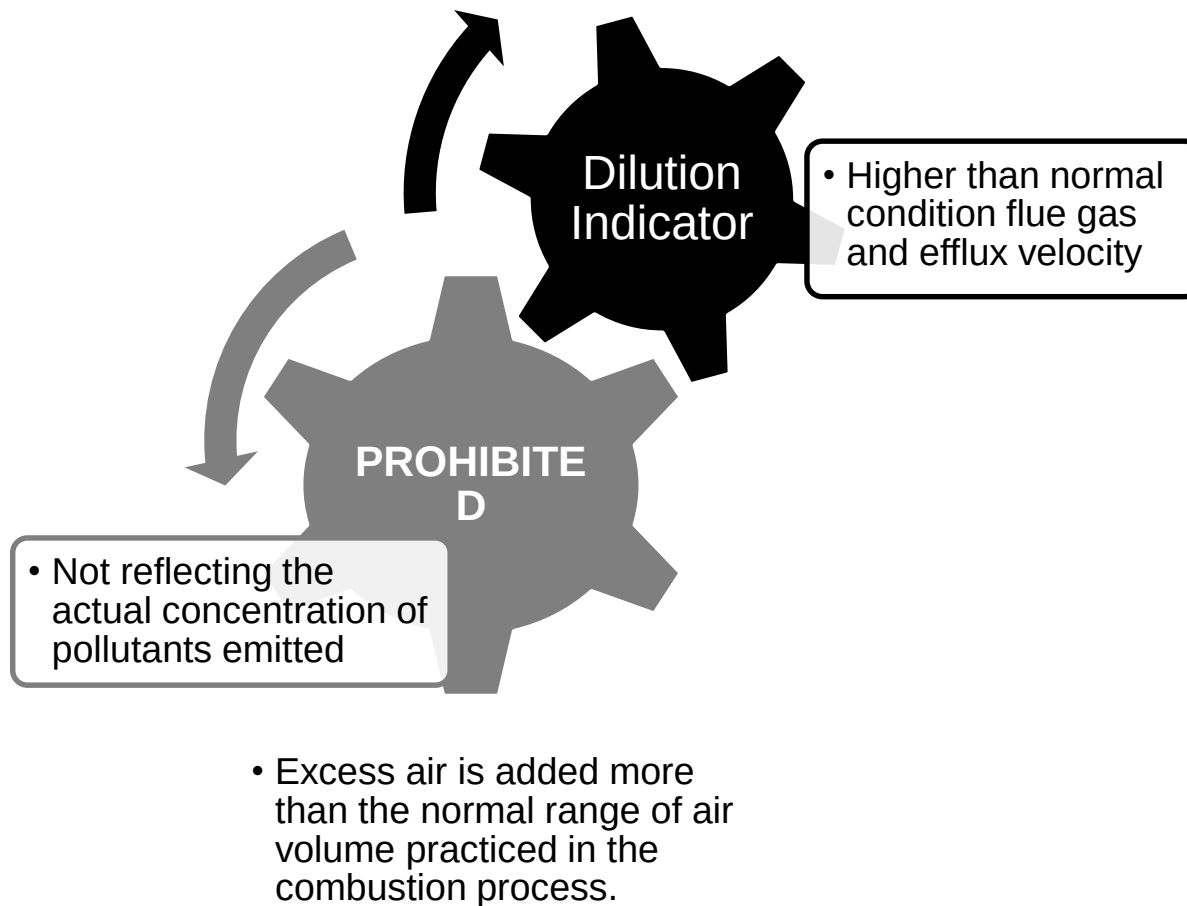
Tentukan
rujukan
 CO_2
adalah
12%

Ditetapkan mengikut
keperluan (case to case
basis) bagi proses yang
memerlukan pembakaran
tidak lengkap seperti kilang
penghasilan kayu arang
(kiln)



REGULATION 14

PROHIBITION ON EMISSION DILUTION





REGULATION 15

HAZARDOUS SUBSTANCES

Fifth (5th) Schedule

CATEGORY (1)

- Extremely Hazardous Substances

CATEGORY (2)

- Carcinogenic Substances

CATEGORY (3)

- Gaseous and volatile organic substances

CATEGORY (4)

- Gaseous and volatile inorganic substances
 - (a) Volatile inorganic substances other than Oxides of Sulfur and Oxides of Nitrogen
 - (b) Oxides of Sulfur and Oxides of Nitrogen

CATEGORY (5)

- Particulate inorganic substances

CATEGORY (6)

- Fibres



REGULATION 15 HAZARDOUS SUBSTANCES

Hazardous substances are listed in:
**“LIST OF HAZARDOUS SUBSTANCES UNDER
REGULATION 15, ENVIRONMENTAL QUALITY (CLEAN
AIR) REGULATIONS 2014”**

CUMULATION RULE

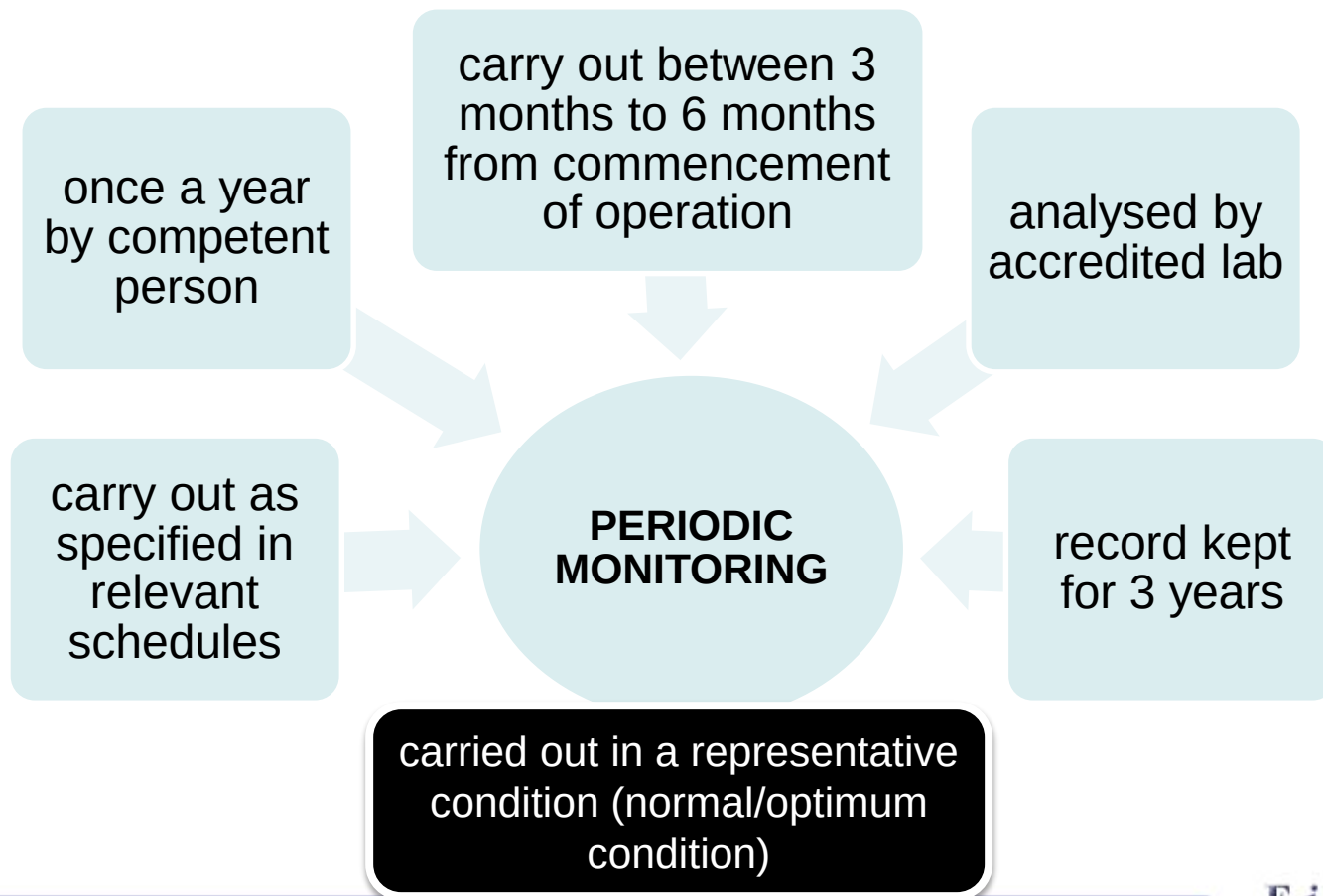
Classes (1) and (2) occur
simultaneously, emission standards
not exceeding class (2)

Classes (1) and (3), classes (2)
and (3) or classes (1), (2) and (3)
occur simultaneously, emission
standards not exceeding class (3)



REGULATION 16

PERIODIC MONITORING





REGULATION 17

CONTINUOUS EMISSION MONITORING

Refer to the specification in these documents

Volume I

- *Guideline For The Installation & Maintenance Of Continuous Emission Monitoring Systems (CEMS) For Industrial Premises / Facilities*

Volume II

- *Guideline For The Continuous Emission Monitoring Systems- Data Interface System (CEMS-DIS)(Version 7.0)*



REGULATION 17

CONTINUOUS EMISSION MONITORING

Notify DOE if:

Regulation 17(6)

Limit values
exceedance



24 hours



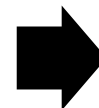
Director
General

Regulation 17(7)

Monitoring
devices fails



< 1 hour



Director

PERATURAN 17

CEMS – KAEDAH MENILAI PEMATUHAN HAD

(3)

tiada purata harian yang melebihi standard pengeluaran, dan tiada purata bagi setengah jam yang melebihi standard pengeluaran lebih daripada dua kali

Premis perlu patuh : 50 mg/m³

CONTOH KES	KEPUTUSAN		PEMATUHAN
	PURATA HARIAN (mg/m ³)	PURATA SETENGAH JAM (mg/m ³)	
PERTAMA	40	40	PATUH
KEDUA	40	70	PATUH
KETIGA	40	130	TIDAK PATUH
KEEMPAT	65	80	TIDAK PATUH
KELIMA	65	130	TIDAK PATUH



REGULATION 18 EMISSION DECLARATION



BORANG AS/PUB/EMISSION
FORM AS/PUB/EMISSION

I

PENGISYTIHARAN PENGELUARAN PUNCA
PENCEMARAN UDARA
DI BAWAH PERATURAN 18, PERATURAN-PERATURAN
KUALITI ALAM SEKELILING (UDARA BERSIH), 2014

EMISSION DECLARATION OF AIR EMISSION SOURCES
UNDER REGULATIONS 18
OF THE ENVIRONMENTAL QUALITY (CLEAN AIR)
REGULATION, 2014

Sila kemukakan borang yang telah lengkap diisi
ke pejabat Jabatan Alam Sekitar Negeri di mana projek/ premis ini
ditempatkan.

Please submit the completed form to the Department of
Environment State Office where the project/premise is located.

JABATAN ALAM SEKITAR
KEMENTERIAN SUMBER ASLI DAN ALAM SEKITAR
DEPARTMENT OF ENVIRONMENT
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT

ANNUAL REPORT FOR PREMISES LISTED IN 1ST SCHEDULE

**NEW
PREMISES**



1st Declaration

12 months after
operation but no later
than 18 months

**EXISTING
PREMISES**



No later than 18
months after CAR
come into operation



PLANNING

New Premises

Written Notification

Submit to DG
(30 days before work commence)

CONSTRUCTION

Construction

AS-built Drawing +
Written Notification
(30 days after operation)

Not
comply

Repair/
Replace

OPERATION

Operation

REPORTING

Existing
Premises

Emission
Declaration

Regulation

Regulation 5

Obligation to notify

Regulation 5(2)

Written Notification

Regulation 7

Air Pollution Control
System

Regulation 18

Emission Declaration

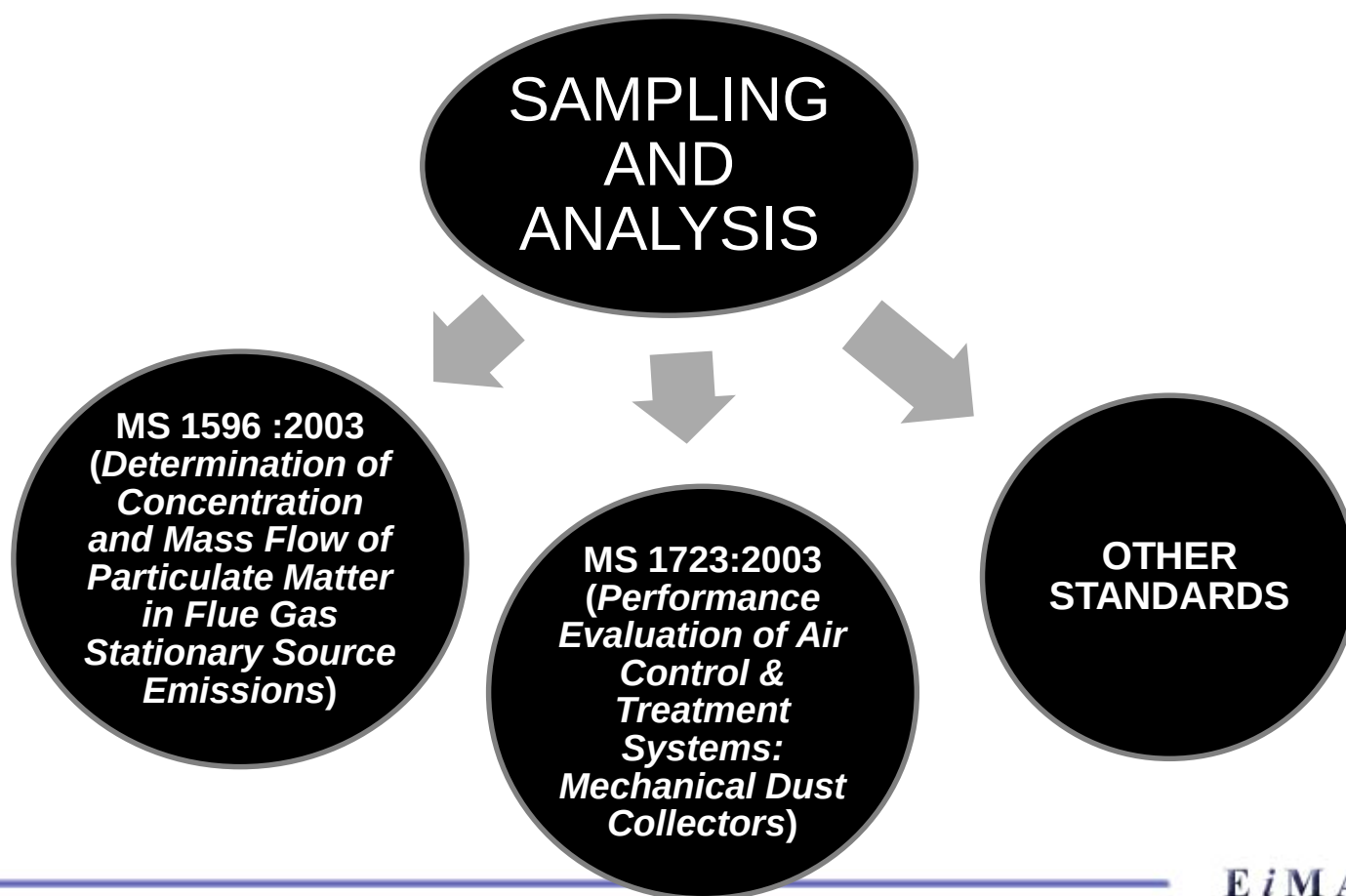
EiMAS

Environmental Institute of Malaysia



REGULATION 23

STANDARD METHOD OF SAMPLING AND ANALYSIS OF EMISSIONS





REGULATION 24: PROHIBITION ORDER

Undesirable occurrence as specified in the Sixth Schedule but not limited to the list.

REGULATION 25: LICENCE REQUIRED TO CONTRAVENE ACCEPTABLE CONDITIONS FOR EMITTING EMISSIONS INTO ATMOSPHERE

Application as in Environmental Quality (Licensing) Regulations 1977

REGULATION 26: SCHEDULE OF REQUIRED ACTIONS

DG may issue a schedule of required actions to comply with a standard:-

- **within a fixed period of time; and**
- **setting an interim standards which may require reduced levels of operation pending the installation of adequate control equipment and may establish a series of deadlines for the installation of specific control equipment.**



REGULATION 27 FEES

**LICENSE
APPLICATION
UNDER
REGULATION**

Money
Order

Postal
Order

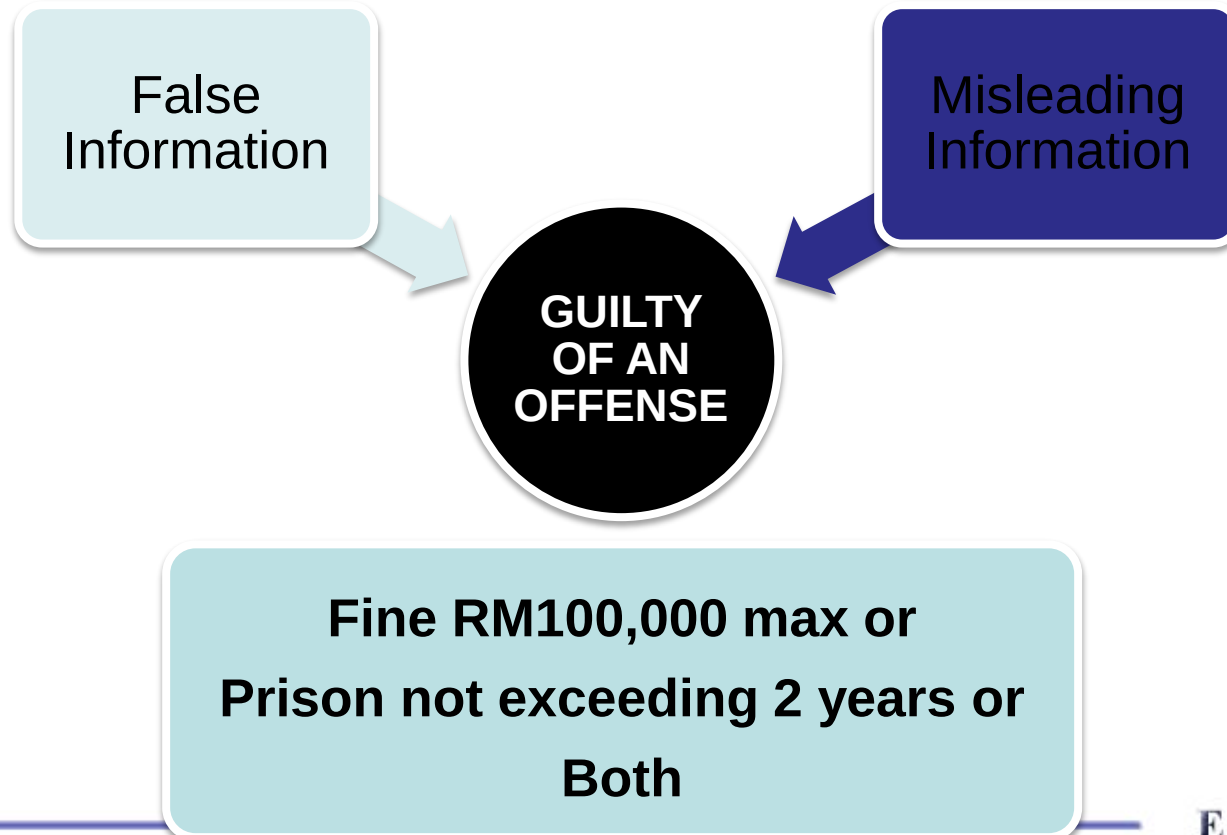
Bank
Draft

Electronic
Payment

**RM 1000
FEE**



REGULATION 28 FALSE OR MISLEADING INFORMATION





REGULATION 29 PENALTY

Fine : RM100,000 max

OR

Prison not exceed 2 years

OR

Both



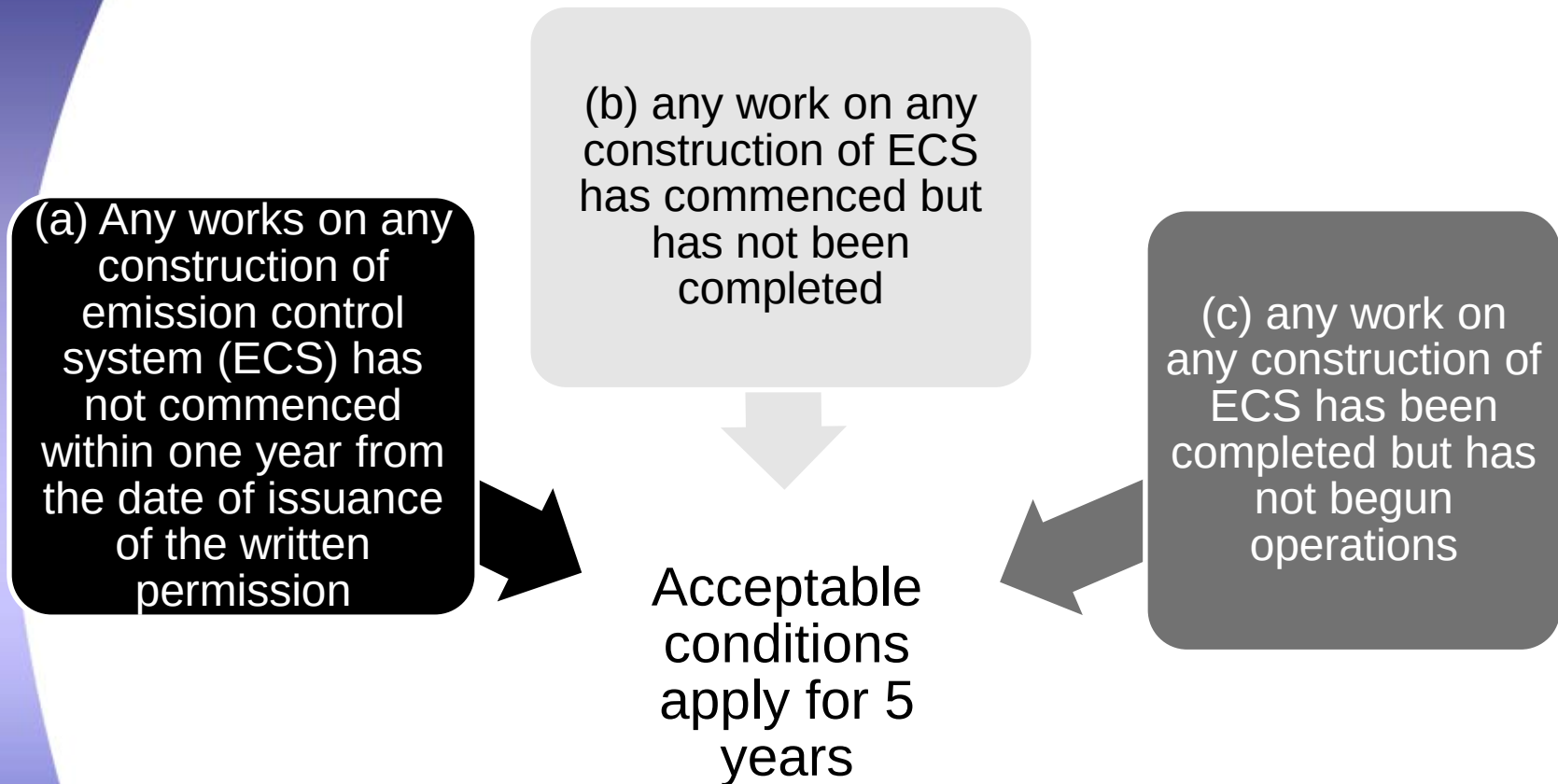
REGULATION 30 REVOCATION

The Environmental Quality (Clean Air)
Regulations 1978 is revoked

The Environmental Quality (Dioxin and Furan)
Regulations 2004 is revoked



REGULATION 30 REVOCATION





2. Introduction to Environmental Quality (Clean Air) Regulation 1978

Commencement: 1 October 1978

Intention: To control emission of air impurities into open air

Amended by: PU(A)40/1979,309/2000

Take note of the amended regulations (i.e. Regulation 2, 11, 12, 13, 49, 56, 58 and Fifth Schedule)



Clean Air Regulations 1978

8 Parts and 5 Schedules

- Part 1 : Preliminary (R1-R3)
- Part II : Industrial Facilities adjacent to residential areas (R4-R6)
- Part III : Burning of Waste (R7-R13)
- Part IV : Dark Smoke (R14-R19)
- Part V : Air Impurities (R20-R43)
- Part VI : Miscellaneous Provisions (R44-R55)
- Part VII : Penalty and Fees (R56-R57)
- Part VIII : Compounding of Offences (R58-R59)



Environmental Quality (Clean Air) Regulations, 1978

Regulation 8

Erection of incinerator to obtain prior approval

- ◆ No person shall erect, construct, install, resite or alter any incinerator without prior written approval from the Director General



Environmental Quality (Clean Air) Regulations, 1978

Regulation 36

Erection of fuel burning equipment

- ◆ Any person intending to erect, install, resite or alter equipment, plant or facility used for the purpose of heating or generation of power that is rated to consume pulverised fuel or any solid fuel at **30 kg** or more per hour or any liquid or gaseous matter at **15 kg** or more per hour, shall obtain prior written approval from the Director General



Environmental Quality (Clean Air) Regulations, 1978

Regulation 38

Erection of chimney

- ◆ Any person intending to erect, install, resite or alter any chimney, from or through which air impurities may be emitted or discharge shall obtain prior written approval from the Director General. This requirement shall not apply to a chimney serving private residence.



3.0 Ambient Air Quality Guideline



AMBIENT AIR QUALITY GUIDELINES

Pollutant	Averaging time	ppm	$\mu\text{g}/\text{m}^3$
Ozone	1 hour	0.10	200
	8 hours	0.06	120
Carbon monoxide # (mg/m^3)	1 hour	30	35
	8 hours	9	10
Nitrogen Dioxide	1 hour	0.17	320
	8 hours	0.04	
Sulfur Dioxide	10 minutes	0.19	500
	1 hour	0.13	350
	24 hours	0.04	105
TSP	24 I hour		260
	1year		90
PM10	24 hour		150
	1 year		50
Lead	3 months		1.5

(at $T = 25^\circ\text{C}$, $P = 1 \text{ Atm}$)

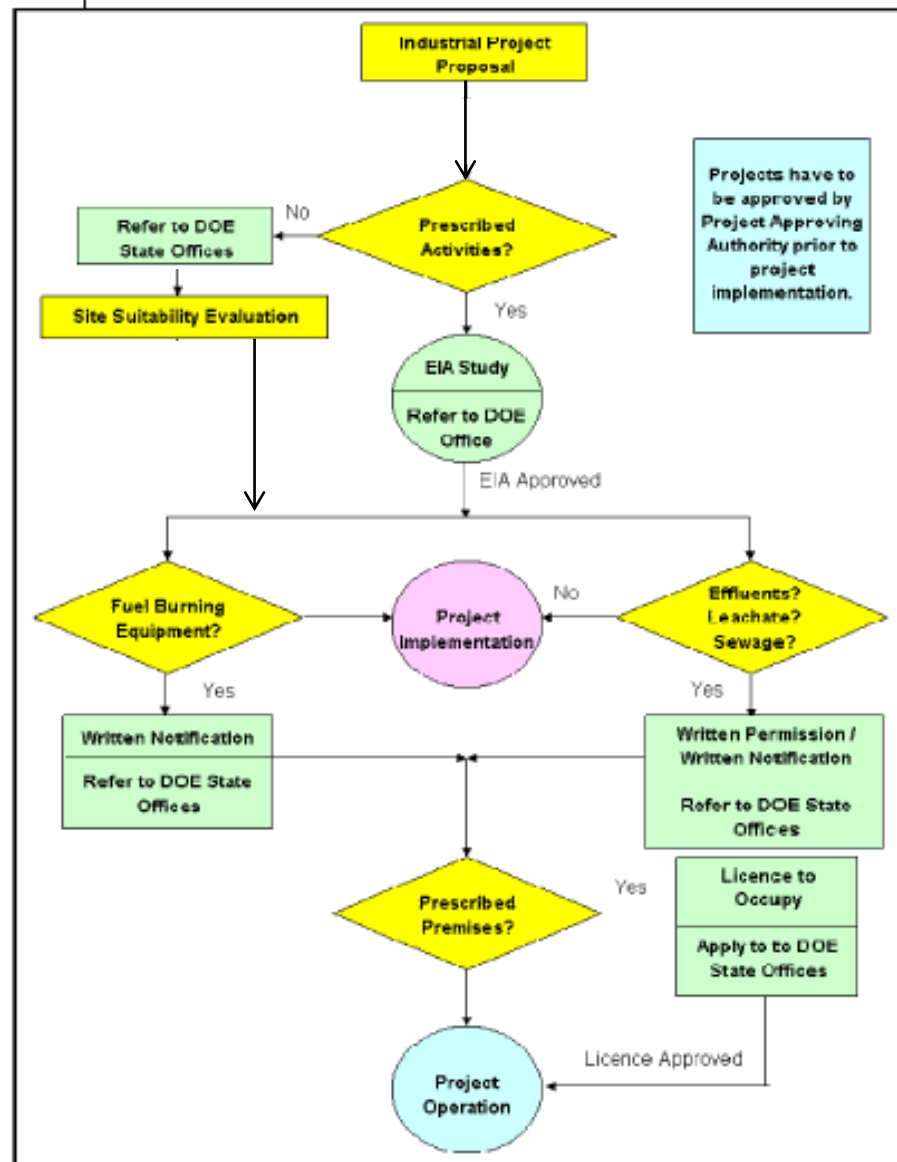


4.0 Written Notification Procedure

- Environmental Impact Assessment (EIA) or Pre-Siting and Evaluation Process (PAT)
- APCS Processing Flow Chart
- Client Charter



APPLICATION PROCEDURE FOR ENVIRONMENTAL REQUIREMENTS IN MALAYSIA



STEP 1

- Site Suitability Evaluation (for non-Prescribed Activities).
- EIA Approval (for Prescribed Activities).

STEP 2

Activities subject to air and water pollution control:

- Written Notification (Air).
- Written Notification (Sewage, Industrial Effluent, Leachate).
- Written Approval (Prescribed Premises: Crude Palm Oil Mills, Raw Natural Rubber Mills, Scheduled Wastes Facilities)

STEP 3

Licence to occupy:

- Crude Palm Oil Mills.
- Raw Natural Rubber Factories.
- Scheduled Waste Treatment and Disposal Activities
- Prescribed Conveyance



Konsep Standard dalam Peraturan Udara Bersih

- ◆ Emission standard (had pengeluaran)
- ◆ Technology standard
- ◆ Operating standard

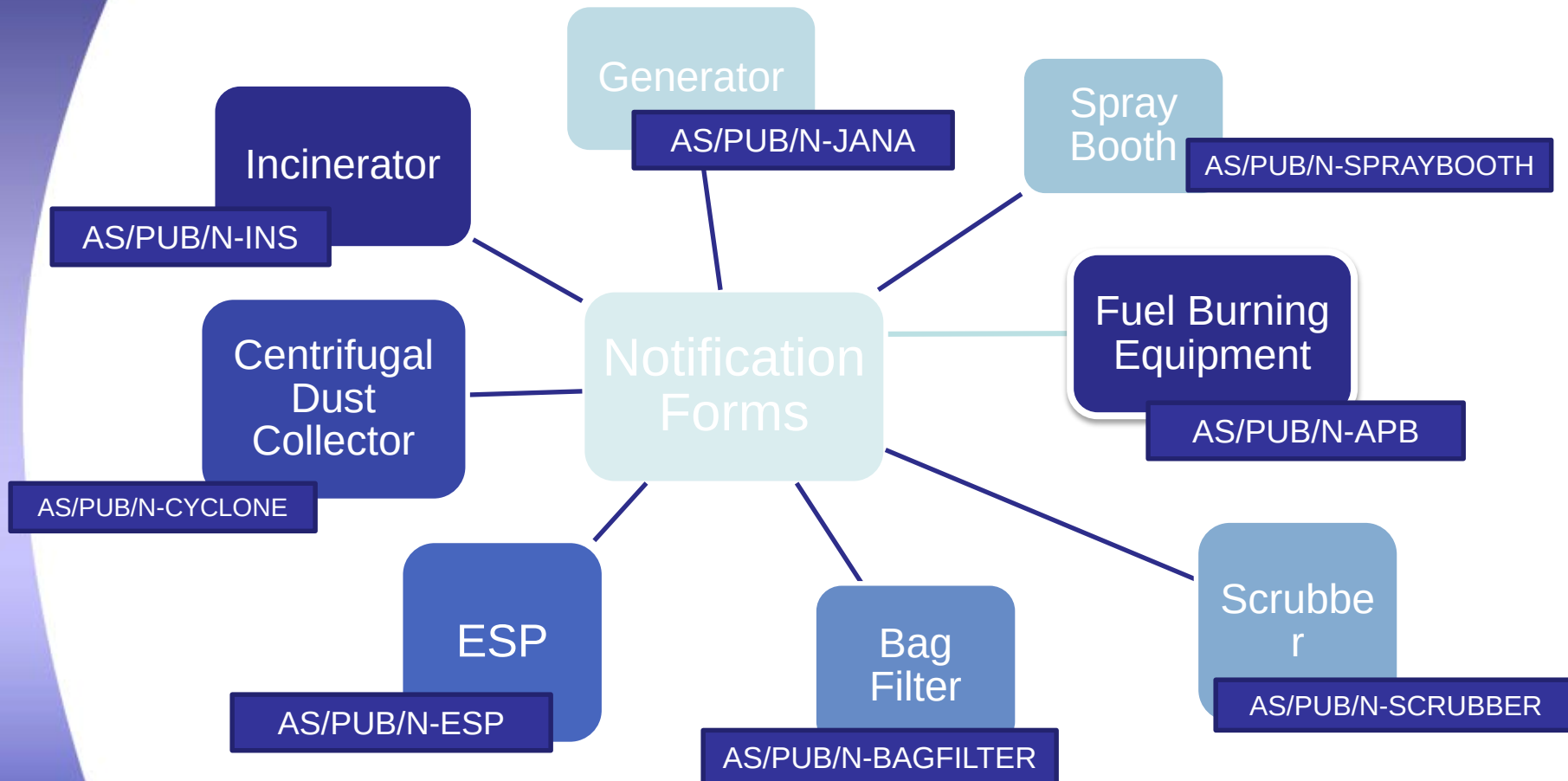


Konsep Standard dalam Peraturan Udara Bersih

- ◆ Emission standard (had pengeluaran)
 - Had spesifik mengikut sektor contoh habuk 150 mg/m³
- ◆ Technology standard
 - Dinyatakan dalam dokumen BAT, Guidance Document Design of Fuel Burning Document and Air Pollution Control System
- ◆ Operating standard
 - Dokumen pengawasan prestasi Alat Kawalan Pencemaran Udara



Written Notification Forms





J. DECLARATION

Saya pemohon/agen* yang diberi kuasa bagi pemohon, dengan ini mengaku bahawa segala maklumat yang diberi di dalam borang ini adalah benar dan betul sepanjang pengetahuan dan kepercayaan saya.

I the applicant/authorised agent of the applicant, hereby declare that all the information given in this application is to the best of my knowledge and belief true and correct.*

Tarikh; _____ Tandatangan pemohon/*: _____
Date Agen yang diberi kuasa
Signature of applicant/*
Authorised agent

Nombor Telefon/Telephone No.: _____ Nama Penuh: _____
Full Name
Nombor Kad Pengenalan: _____
Identity card no.

Nombor Faks/Fax No: _____ Jawatan: _____
Designation

Cop Rasmi Syarikat: _____
Official Stamp of the Company

Untuk dan bagi pihak: _____
For and on behalf of: _____

Nombor Telefon .: _____ Nombor Faks: _____
Telephone No. Fax No.

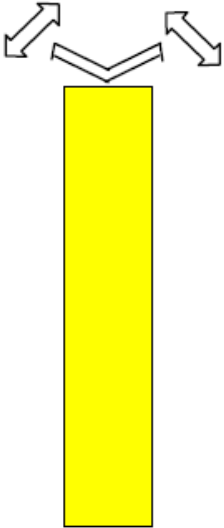
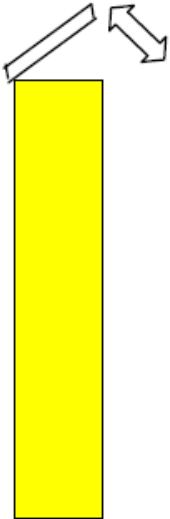
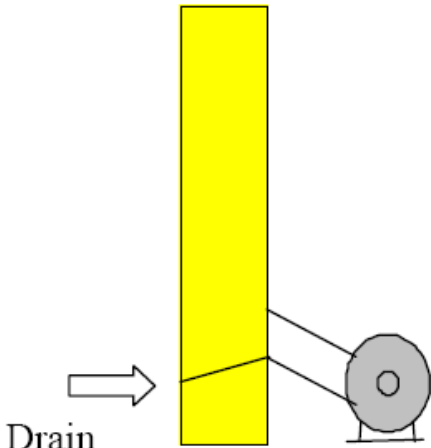
* Potong yang mana tidak berkenaan
Delete whichever is not applicable





Stack design – rain cap

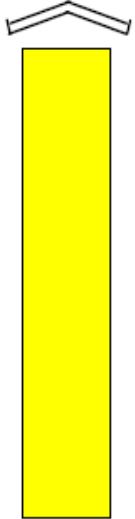
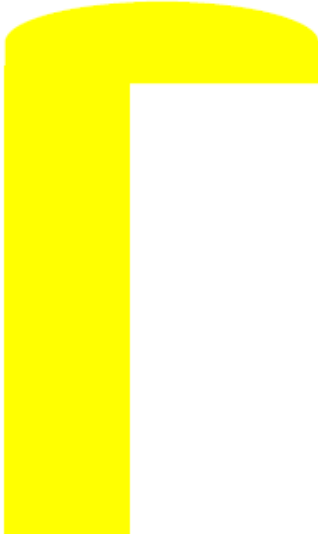
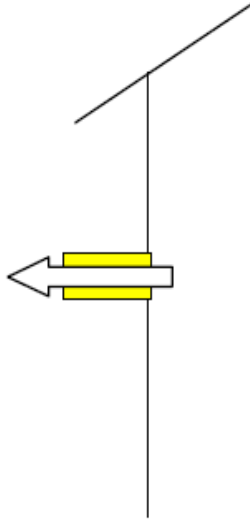
Example of Acceptable Stack Design

		
Stack A	Stack B	Stack C
Acceptable stack design with rain protection without obstructing air flow. The rain protection on stack A and B pushed up when the fan is on. Stack C is design so that water drains out the side of the stack		



Stack design – rain cap

Example of Unacceptable Stack Design

		
Stack A	Stack B	Stack C
The cap on Stack A obstructs vertical discharge of air contaminants. Stack B, a goose neck, also prevents vertical discharge. Stack C, which comes out of the building horizontally, simply does not provide for vertical discharge.		



Operation of Industries / Air Pollution Control Equipment

- ◆ performance monitoring
- ◆ record keeping (log book)
- ◆ competent operator
- ◆ stack sampling
- ◆ continuous emission monitoring system (CEMS)



Operation of Industries / Air Pollution Control Equipment

- ◆ **Important of performance monitoring**
- ◆ To ensure **smooth** and **uninterrupted operation** of air pollution control system
- ◆ Helps **detect early** onset of deteriorating performance of control system
- ◆ Hence, **avoid unnecessary plant shutdown** and **costly enforcement penalties**
- ◆ From enforcement viewpoint, it is an acceptable surrogate to stack emission testing to **gauge compliance** with emission standards



Operation of Industries / Air Pollution Control Equipment

Regulatory record keeping requirements

- ◆ Essential for smooth operation of APCS, may lengthen its useful life and minimize emission
- ◆ May vary from one industry to another depending on **type** of manufacturing process being controlled, **size** of operation, **location** of industry.
- ◆ Performance monitoring data to be kept and made available to DOE officers for inspection (examine **log books**)



Competency course

EiMAS's 2015

Training Calendar for Industries

NO	COURSE CODE	COURSE TITLE	COURSE FEE (RM)	NO OF DAYS	YEAR 2015											
					JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEPT	OCT	NOV	DEC
1	CePSWaM	Course for Certified Environmental Professional in Scheduled Waste Management (Inclusive 1 day examination)	3,300	5	12 - 16	09 - 13	09 - 13	06 - 10	11 - 15	08 - 12		10 - 14	07 - 11	05 - 09	01 - 05	30 Nov - 04 Dec
		26 - 30			23 - 27	22 - 26	13 - 17	18 - 22	17 - 21			28 Sept - 02 Oct	19 - 23	16 - 20	07 - 11	
							20 - 24	25 - 29	23 - 27						14 - 18	
				Examination for CePSWaM (For re-sit - Practical or Written or Both RM400 will be charged)	1	16 & 30	13 & 27	13 & 26	10, 17 & 24	15, 22 & 29	12		14, 21 & 27	11	02, 09 & 23	05 & 20
For registration, kindly contact: Airwastewater Management Sdn Bhd (Tel : 06 763 0088/ Fax : 06 763 0087), Website : http://www.awwam.com Person in charge : [Mr. Mohamad Daniel (Email : daniel@awwam.com) / (HP : 016 637 4774)] / [Ms. Salbiah binti Sulaiman (Email : salbiah@awwam.com)]/(HP : 0112 638 5844)]																
2	CePBFO	Course for Certified Environmental Professional in Bag Filter Operation (Inclusive 1 day examination)	4,000	5			23 - 27	13 - 17	11 - 15	01 - 05	27 - 31	17 - 21	07 - 11	19 - 23		30 Nov - 04 Dec
		Examination for CePBFO (For re-sit - Practical or Written or Both RM400 will be charged)	1	27			17	15	05	31	21	11	23	04		
		For registration, kindly contact: Master Jaya Greentech Sdn Bhd (Tel : 03 8962 6233/ Fax : 03 8962 6211), Website : http://www.masterjaya.com.my Person in charge : [Ms Hafizah (Email : training@masterjaya.com.my)]/(HP : 017 292 6978)]														
3	CePSO	Course for Certified Environmental Professional in Scrubber Operation (Inclusive 1 day examination)	4,000	5			30 Mar - 03 April	18 - 22	08 - 12		03 - 07		05 - 09	02 - 06	14 - 18	
		20 - 24					22	12	24 - 28							
									07 & 28							
				Examination for CePSO (For re-sit - Practical or Written or Both RM400 will be charged)			1	03 & 24								
For registration, kindly contact: Master Jaya Greentech Sdn Bhd (Tel : 03 8962 6233/ Fax : 03 8962 6211), Website : http://www.masterjaya.com.my Person in charge : [Ms Hafizah (Email : training@masterjaya.com.my)]/(HP : 017 292 6978)]																



This course would:

- ◆ Enable participants to acquire knowledge and develop skills on how to implement a systematic and effective preventive maintenance and performance monitoring procedure for bag filters or scrubber that conforms with the DOE's latest requirement on **performance monitoring** of bag filters and scrubber.
- ◆ Enable participants to be **certified and qualified** as a **competent person** to operate bag filters or scrubber after complying with other requirements.
- ◆ Benefit the industry by minimizing the occurrence of breakdown of bag filter or scrubber that may result in non compliance with emission standards.

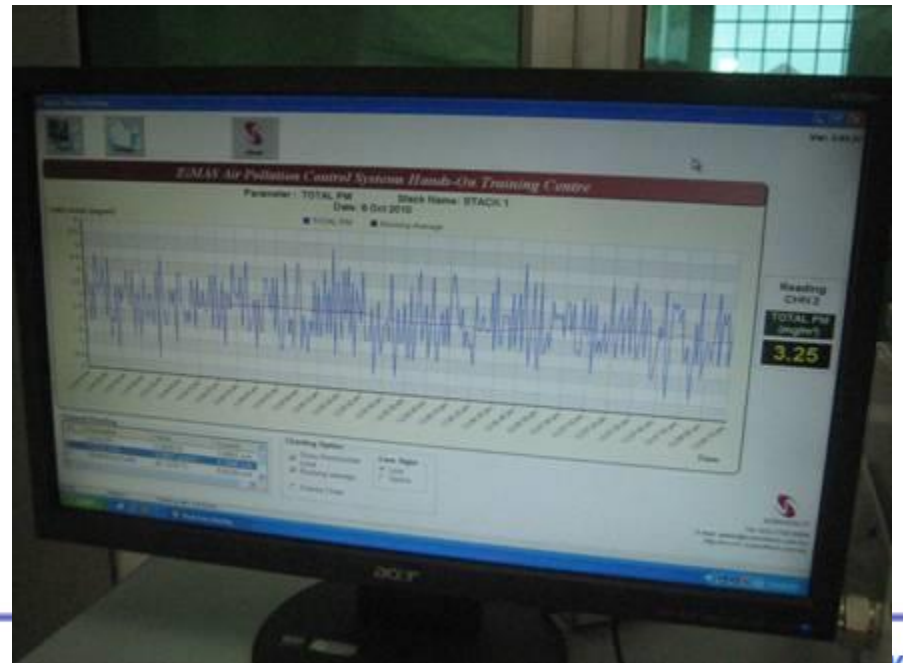


Alamat:
No. 13, Jalan 9/4
Seksyen 9
43650 Bandar Baru Bangi



EIMAS

Environment Institute of Malaysia







7. Other Related Regulations

REGULATIONS

- Environmental Quality (Control of Petrol And Diesel Properties) Regulations 2007 - P.U.(A) 145/2007
- Environmental Quality (Control of Emission From Motorcycles) Regulations 2003 - P.U. (A) 464/2003
- Environmental Quality (Halon Management) Regulations 1999 - P.U.(A) 452/99
- Environmental Quality (Refrigerant Management) Regulations 1999 - P.U (A) 451/99
- Environmental Quality (Control of Emission From Petrol Engines) Regulations 1996 - P.U(A) 543/96
- Environmental Quality (Control of Emission From Diesel Engines) Regulations 1996 P.U (A) 429/96
- Environmental Quality (Motor Vehicle Noise) Regulations 1987 - P.U (A) 244/87
- Environmental Quality (Control of Lead Concentration in Motor Gasoline) Regulations 1985 - P.U (A) 296/85
- Environmental Quality (Licensing) Regulations 1977 - (P.U.(A) 198/77)

ORDER

- Environmental Quality (Declared Activities) (Open Burning) Order 2003 - P.U.(A) 460/2003
- Environmental Quality (Delegation Of Powers) (Halon Management) Order 2000 - P.U.(A) 490/2000
- Environmental Quality (Prohibition Of The Use Of Controlled Substances In Soap, Synthetic Detergent And Other Cleaning Agents) Order 1995) Order 2005 - P.U.(A) 115/95
- Environmental Quality (Prohibition Of The Use Of Chlorofluorocarbons And Other Gases As Propellants And Blowing Agents) Order 1993 - P.U.(A) 434/93



Guidelines

- **Technical Guidance On: Performance Monitoring of Air Pollution Control Systems**
- **The Planning Guidelines for Environmental Noise Limits & Control**
- **The Guidelines for Noise Labeling and Emission Limits of Outdoor Sources**
- **The Planning Guidelines for Vibration Limits and Control**
- **Guideline for the installation & maintenance of Continuous Emission System (CEMS)**

Book
5



Technical Guidance
Document Series
Number:
DOE-APCS-5

TECHNICAL GUIDANCE ON

PERFORMANCE MONITORING OF AIR POLLUTION CONTROL SYSTEMS

DOE Malaysia
First Edition:
December 2006

FOR THE USE OF
THE INDUSTRIES AND
CONSULTANTS



THE PLANNING
GUIDELINES FOR

BOOK 1 OF 3

Environmental Noise Limits and Control



Department of Environment
Ministry of Natural Resources and Environment
Malaysia



EiMAS

Environment Institute of Malaysia



THE PLANNING
GUIDELINES FOR

BOOK 3 OF 3

Vibration Limits and Control in the Environment



Department of Environment
Ministry of Natural Resources and Environment
Malaysia



GUIDELINES
FOR

BOOK 2 OF 3

Noise Labeling and Emission Limits of Outdoor Sources



Department of Environment
Ministry of Natural Resources and Environment
Malaysia





Malaysian Standard

- **MS1596:2003 - Determination of concentration and mass flow of particulate matter in flue gas for stationary source emissions**
- **MS1723:2003 – Performance evaluation of air pollution control and treatment system : Mechanical dust collectors**



MALAYSIAN STANDARD

MS 1596:2003

DETERMINATION OF CONCENTRATION AND MASS FLOW OF PARTICULATE MATTER IN FLUE GAS FOR STATIONARY SOURCE EMISSIONS

ICS: 13.040.40

Descriptors: stationary source emissions, particulate matter, flue gas, determination, gravimetric analysis

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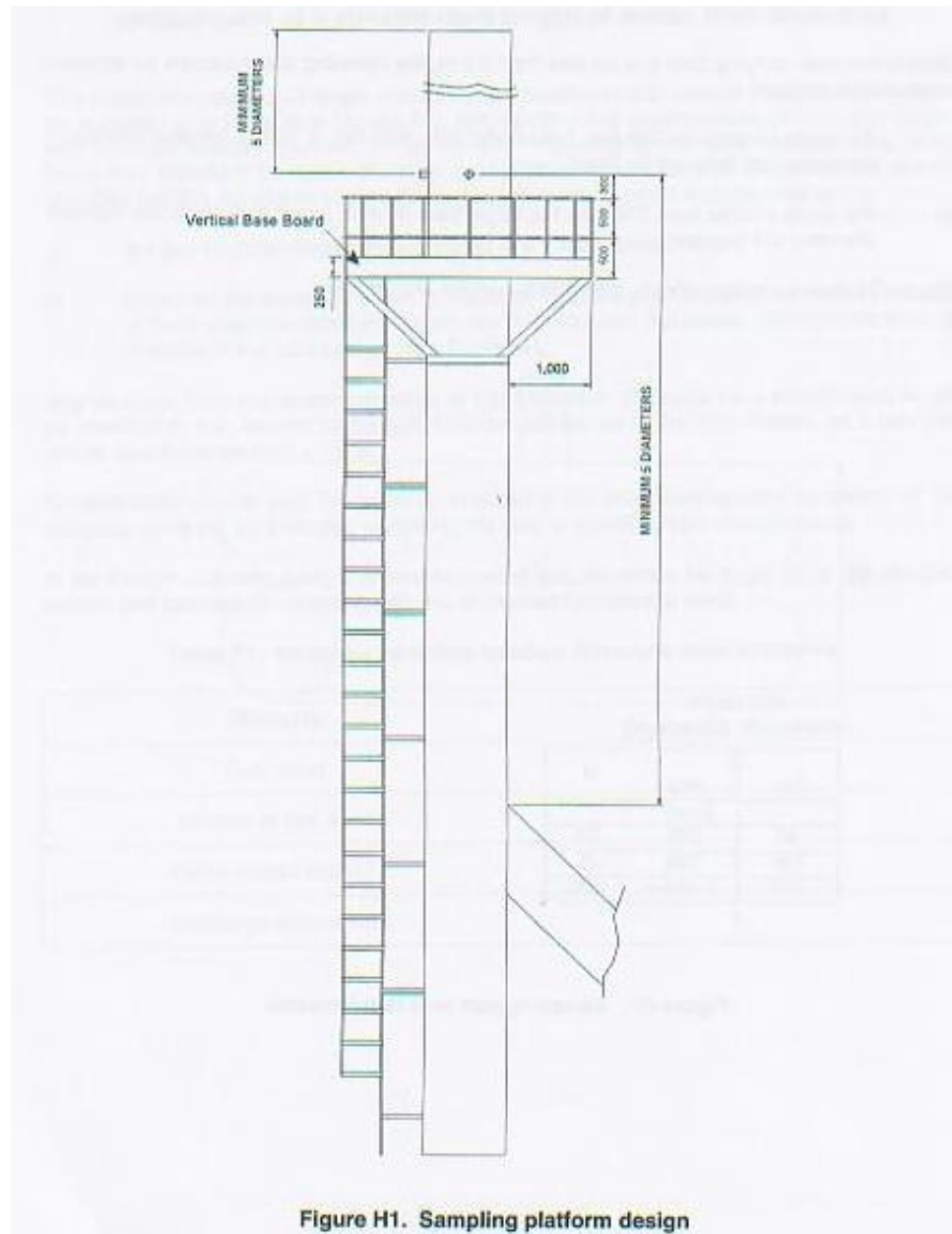


Figure H1. Sampling platform design



MALAYSIAN STANDARD

MS 1723:2003

PERFORMANCE EVALUATION OF AIR POLLUTION CONTROL AND TREATMENT SYSTEMS: MECHANICAL DUST COLLECTORS

ICS: 13.040.40

Descriptors: air pollution control, performance evaluation, dust collectors, mechanical, testing procedure

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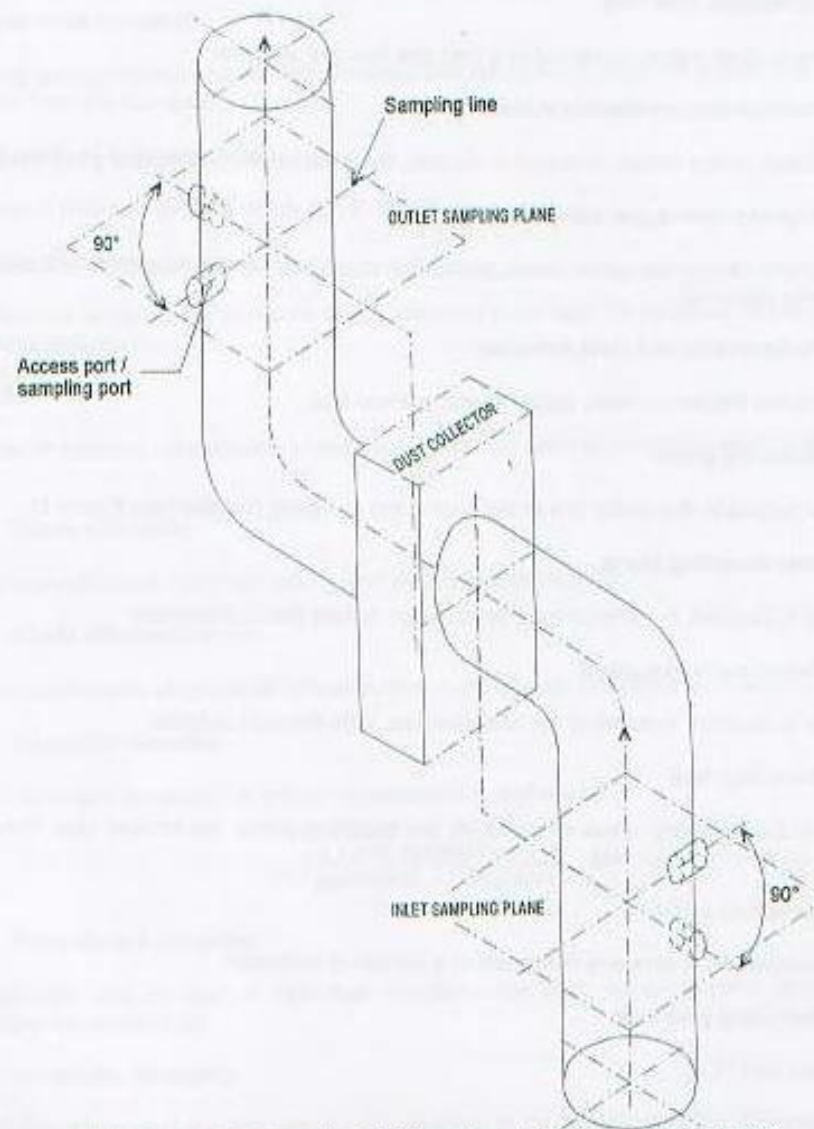


Figure 1. Illustration of definitions in relation to a circular duct

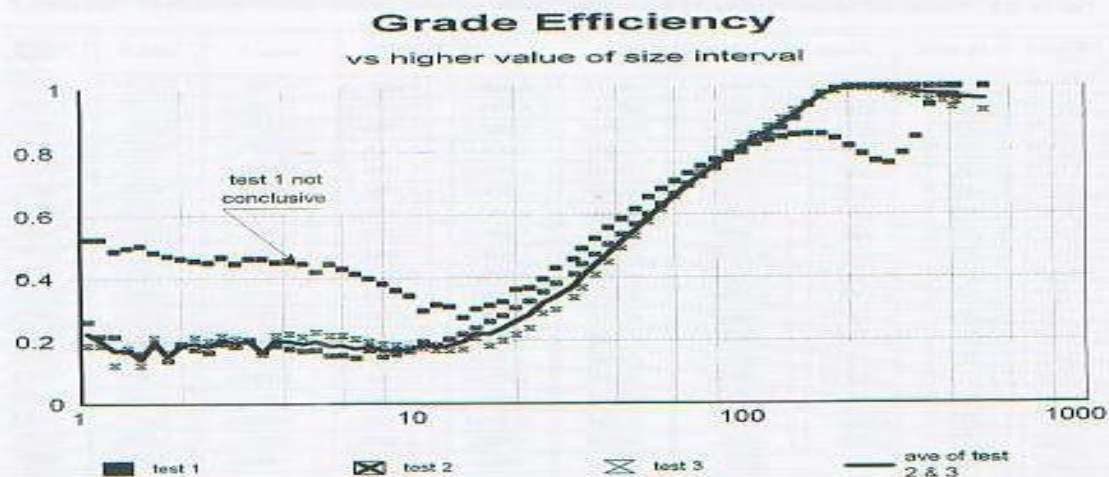


Figure A1. Graph of efficiency per particle size interval using the higher value of the particle size interval

Tests 2 and 3 show similar curves, with only mild differences in the ranges from 10 μm to 50 μm and above 300 μm . Test 1, however, shows a clear difference in the performance of the dust collector. It may indicated some difference in the condition of the dust collector between this and the other two tests. A third test is therefore necessary to conform with the required three representative tests (Clause 12).



MALAYSIAN STANDARD

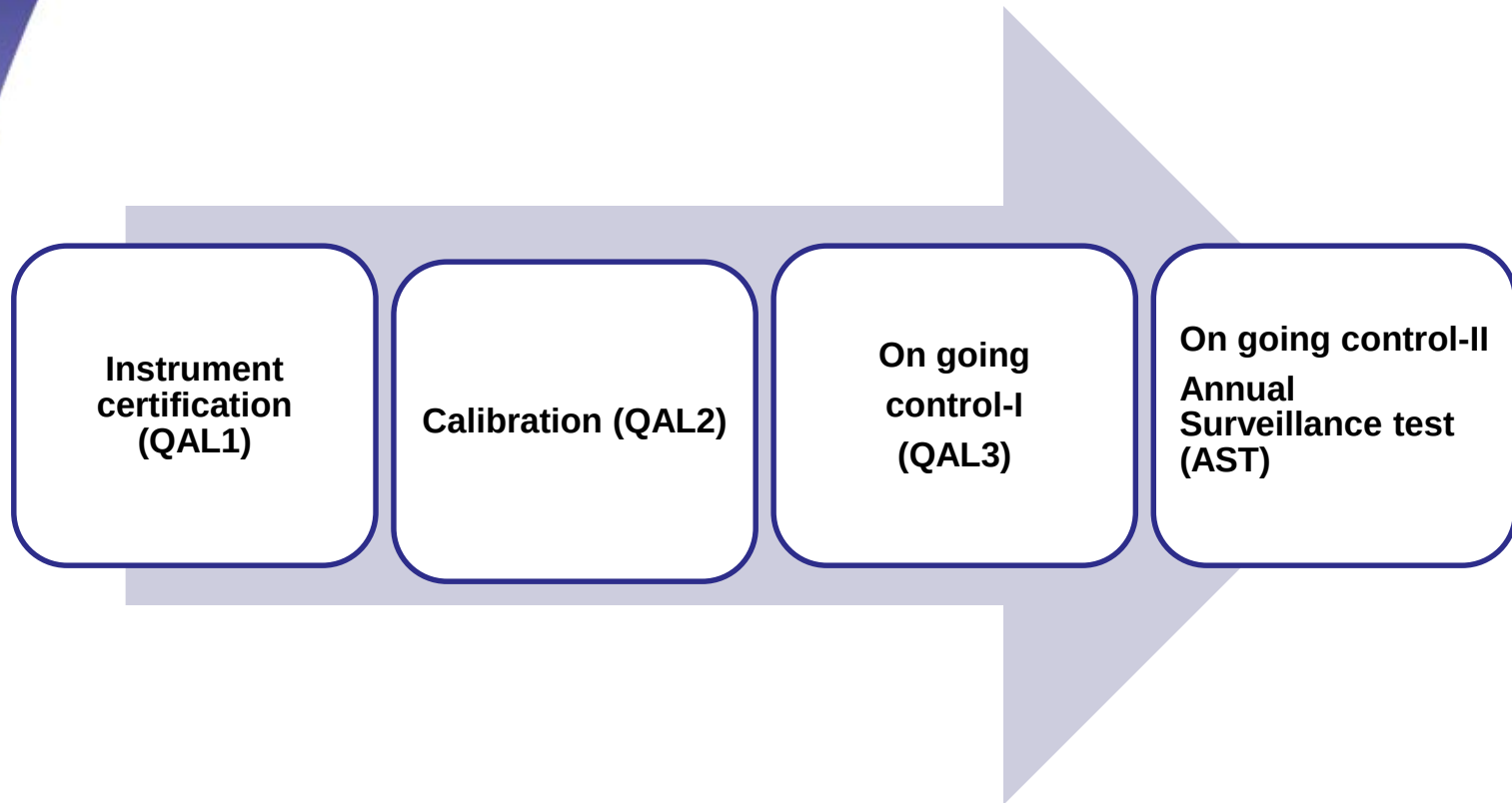
MS 2564:2014

**Performance criteria and test procedures
for continuous emission monitoring
systems (CEMS)**

ICS: 13.040.40

Description: air, quality, air pollution, continuous emission monitoring, performance criteria, test procedure

3 LEVELS TO ENSURE QUALITY (Quality Assurance Level-QAL)





PEMS

- ◆ Predictive Emission Monitoring System (PEMS) is an alternative to Continuous Emission Monitoring System (CEMS). CEMS is *hardware-based* monitoring system; PEMS is *software-based simulation*.
- ◆ **Software-based monitoring**
- ◆ Modelling +simulation
- ◆ Daily zero + span check
- ◆ Using process inputs

However PEMS is suitable for certain industry only



PEMS Technologies

- ◆ Parametric
- ◆ First principal
- ◆ Neural Network
- ◆ Statistical Hybrid



PEMS

PEMS need to comply with

- ◆ 40 CFR Part 60, PS-16
- ◆ 40 CFR Part 75, Subpart E



PEMS - Conditions of Approval

Quality Assurance

Test	Acceptability	Frequency
Sensor Evaluation	Daily Sensor Evaluation Check. Your sensor evaluation system must check the integrity of each PEMS input at least daily.	Daily
RAA	3-test average $\leq$ 3-test average $\leq 10\%$ of simultaneous analyzer or RM average	Each quarter except quarter when RATA performed
RATA	Same as for RA in Sec. 13.1 PS-16	Yearly in quarter when RAA not performed
Bias correction	If $d_{avg} \leq cc $	If bias test passed (no correction factor needed)
PEMS Training	If $F_{critical} \geq F$, $r \geq 0.8$	Optional after initial and subsequent RATAs
Sensor Evaluation Alert Test(optional)	Section 6.1.8 PS-16	After each PEMS training

Performed diagnostic test on each drive

Defrag each harddrive

Performed incremental database backup

Backup the database and archive

Perform PEMS hardware maintenance

Computer Maintenance



Q&A

Thank you