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EMB MEMORANDUM CIRCULAR
No. 2021 - **14**

SUBJECT : ESTABLISHMENT OF AN INTEGRATED AIR QUALITY NETWORK CENTER THAT MONITORS AND SERVES AS REPOSITORY OF REAL-TIME INDUSTRIAL EMISSION FROM FIRMS REQUIRED TO INSTALL CONTINUOUS EMISSIONS MONITORING SYSTEMS (CEMS)/CONTINUOUS OPACITY MONITORING SYSTEM (COMS) THROUGH THE USE OF A UNIFORM DATA ACQUISITION AND HANDLING SYSTEM (DAHS), AND IN RELATION TO CLARIFY PERTINENT PROVISIONS OF DEPARTMENT ADMINISTRATIVE ORDER NO. 2017-14

SECTION 1. RATIONALE

Section 38 of the Philippine Clean Air Act of 1999 (RA 8749), the Department through the Bureau shall require any person who owns or operates any emission source to: (a) establish and maintain relevant records; (b) make relevant reports; (c) install, use and maintain monitoring equipment or methods.

Continuous Emissions Monitoring Systems/Continuous Opacity Monitoring Systems (CEMS/COMS) are globally recognized technology used to measure emissions/opacity in stacks of industrial sources.

Under Department Administrative Order No. 2000-81, in relation to Department Administrative Order No. 2007-22 *"Guidelines on the Requirements for Continuous Emission Monitoring Systems (CEMS) and Other Acceptable Protocols, thereby Modifying and Clarifying certain Provisions of Section 5, Rule X of DAO 2000 - 81 and Other Related Provisions"*, major industries are required to install CEMS/COMS to monitor their industrial emission.

Furthermore, Department Administrative Order No. 2017-14 was enacted to require major industries to transmit their CEMS/COMS data to the EMB's data server and act as a repository of all industrial emissions data.

Pursuant to the said provisions and to further effectively and efficiently provide a seamless transmission and monitoring of industrial emissions data from the major industries stated above, the EMB hereby promulgates this Circular for the establishment of an integrated air quality monitoring network that serves to upgrade the existing EMB data server.

SECTION 2. OBJECTIVES

To effectively and efficiently transmit emissions data from the CEMS/COMS of industrial sources to the EMB DAHS server for the purpose of monitoring its compliance with the emission standards set forth under the Philippine Clean Air Act.

To clarify paragraph 2, Section 3 of Department Administrative Order No. 2017-14 on the number of minutes in the hourly transmission of data and the mode of transmission of data from industrial sources to the EMB data server.

SECTION 3. DEFINITION OF TERMS

a. **Excess Emission** – the emission concentration recorded by CEMS/COMS which exceeds any applicable emission limits or standards pursuant to Section 19 of RA 8749. The said excess emission shall be considered as actual exceedance under Section 45 thereof.

b. **Data Acquisition and Handling System (DAHS)** – the CEMS hardware and software components that take the output from the analyzers, combine it with other information, compute emissions.

c. **Startup** – the setting-in of operation of an affected facility for any purpose. The end of the startup period shall begin upon the return to the normal operating condition of an Air Pollution Source Equipment/Installation (APSEs/APSIs) from a shutdown and/or malfunction state, such as but not limited to the following: return of power supply to the Grid/In-House; return to normal operation or manufacturing condition.

d. **Show Cause Order (SCO)** – an order issued by the Bureau, or any of its authorized representatives, apprising the firm subject of the complaint, indicating the acts or omissions being complained of, and requiring them to explain the said acts or omission.

e. **Shutdown** – the cessation of operation of an affected facility for any purpose.

f. **Malfunction** – any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Provided, that failures caused in part by poor maintenance or careless operation are not malfunctions.

g. **Zero-Data Loss** – a configuration in the system to preserve the data by having a buffer of at least 60 days in the event that a communication cannot be established.

SECTION 4. INTEGRATION AND CONFIGURATION OF THE EMB'S DATA SERVER THROUGH THE USE OF DATA ACQUISITION AND HANDLING SYSTEM (DAHS)

The EMB-Central Office (EMB-CO) shall have the authority to access the DAHS server of all EMB-ROs and shall be responsible for integrating every regional DAHS server. To do this, the EMB-ROs shall ensure that their DAHS server is compatible with the DAHS server used by the EMB-CO.

All EMB-ROs shall establish a secured infrastructure to receive and store CEMS/COMS data. The EMB-RO shall reconfigure their DAHS server to automatically send a Show Cause Order (SCO) in the event of any exceedance and/or failure to comply with the data capture rate as mentioned in *Annex A*.

SECTION 5. MODE OF DATA TRANSMISSION

To effectively monitor the emissions data being transmitted to the EMB FTP server, the EMB-RO shall require the industries' to transmit CEMS/COMS data to the EMB-DAHS server for *validation*. The validation process shall check compliance of said data with the emission standards and the veracity of data submitted, among others. Thereafter, the EMB-RO shall forward the said data to the EMB-CO FTP server for record-keeping.

Further, the EMB-RO shall require all firms operating CEMS/COMS to transmit (in real-time) the data based on the standards set herein:

Parameter (mg/Ncm)	Data Transmission	1-hour equivalent based on DAO No. 2017-14
Gases (CO, NOx as NO_2, SOx as SO_2) and Particulate Matter (PM) **	Every five (5) minutes	12 x 5-minutes
Opacity*	Every five (5) minutes	12 x 5-minutes

*Unit of measurement: Percent (%)
**Should be expressed in milligrams per normal cubic meter corrected to standard oxygen as prescribed by EMB.

The EMB-RO, through their Planning and Information System Management Unit (PISMU), shall coordinate with the concerned firms to facilitate the secured connection of the CEMS/COMS DAHS to the EMB DAHS server. The transmission of data shall be configured to have Zero-Data Loss. Also, the EMB-RO shall ensure that the concerned firms will comply with the requirements under Annex A and Annex B of this Circular.

SECTION 6. DETERMINATION OF EXCEEDANCE THROUGH THE USE OF EXCESS EMISSION AVERAGING TIME

The DAHS shall automatically determine the excess emission averaging time and thereafter compare with the applicable standards the following excess emission averaging time as set forth below:

(1)   **Opacity:** Excess emissions are defined as **any rolling five-minute period during which the average opacity of emissions exceeds 20 percent opacity.** Provided, (1) that the opacity limit herein before prescribed shall not apply to the emission of dark smoke for less than five (5) minutes in a period of one (1) hour; (2) that the total period of such emission shall not exceed an aggregate of fifteen (15) minutes in any twenty-four (24) hours;

(2)   **Oxides of Sulfur as Sulfur Dioxide (SO_X as SO_2):** Excess emissions (for facilities using CEMS) are defined as **any rolling three-hour period during which the average emissions (rolling arithmetic average of three contiguous one-hour periods, reported every 5-minutes)** of SO_X as SO_2 exceed the applicable standards;

(3)   **Oxides of Nitrogen as Nitrogen Dioxide (NO_X as NO_2):** Excess emissions (for facilities using CEMS) are defined as **any rolling three-hour period during which the average emissions (rolling**

arithmetic average of three contiguous one-hour periods, reported every 5-minutes) exceed the applicable NO_X as NO_2 standards;

(4)   **Particulate Matter (PM):** Excess emissions (for facilities using CEMS that measures PM) are defined as **any rolling one-hour period during which the average emissions (rolling arithmetic average of one-hour period, reported every 5-minutes)** exceed the applicable standards; and

(5)   **Carbon Monoxide (CO):** Excess emissions (for facilities using CEMS) are as **any rolling 4-hour period during which the average emissions (rolling arithmetic average of four contiguous one-hour periods, reported every 5-minutes)** exceed the applicable standards.

Any of the above excess emission shall be considered exceedance in the applicable emission standards stated under the Philippine Clean Air Act, provided that the emission exceedance shall not apply during periods of **start-up, shutdown, and malfunction.**

In the case of emission exceedance, only positive Integer shall be considered and Truncate any decimal parts (See Annex C)

SECTION 7. ACTIONS TAKEN IN CASE OF EXCEEDANCE

In the event of any exceedance detected by the EMB DAHS server (based on the Excess Emission Averaging Time), the system will automatically send an SCO directly to the owner or permit holders of the PTO, through email. Provided that, the firm(s) concerned may submit their explanation in writing within 24 hours upon receipt of the SCO, otherwise, non-submission of the explanation shall mean that the exceedance is considered as a legitimate exceedance, and shall therefore be elevated to the Pollution Adjudication Board for the imposition of penalty.

The issuance of an SCO shall be on a per pollutant basis. Single or multiple excess emissions recorded within the day shall constitute only one (1) SCO. As used in this Circular, one day shall start from midnight to midnight of the following day (0000H to 2400H). Any excess emission that cuts through the following day shall be recorded to the day where the majority of the exceedance took place. *(See Annex C)*

SECTION 8. DATA MANAGEMENT

The EMB-RO shall ensure that all firms operating a CEMS/COMS provide a permanent record of emissions and process parameters.

The EMB-RO shall require the owners or operators, subject to the provisions of DAO No. 2000-81, to maintain at least five (5) years of their record for inspection. The record shall be made available upon the validation of the EMB and shall include the following:

1.   Occurrence and duration of any start-up, shutdown, or malfunction in the operation of any source or control facility;

2.   Audits, performance testing, evaluations, calibration checks, adjustments

and maintenance of any continuous emission monitors that have been installed pursuant to Rule X, Section 5 of DAO No. 2000-81 and other applicable provisions stated under 40 CFR Part 60 Appendix B;

3. The measurements shall comply with at least 75% data capture rate to become valid subject to the audits (RATA, RAA, CGA, etc.) as stated in the Quality Assurance and Quality Control Plan of the CEMS/COMS; and

Further, the EMB-RO shall ensure that the CEMS/COMS data sent by the firms will not be tampered or altered. Any tampered or altered data transmitted to the DAHS server of the EMB-RO shall warrant an automatic issuance of a Notice of Violation under existing laws and regulations.

SECTION 9. PERIOD OF COMPLIANCE

All EMB-ROs are given one (1) year from the issuance of this Memorandum Circular to establish and enhance their Air Quality Monitoring Network and connect it to the EMB-CO's DAHS server.

Furthermore, the EMB-ROs shall ensure the firms' compliance with their submitted commitment plans in the transmission of their data to the EMB DAHS server. Likewise, for the firms that were not able to submit any commitment plans, the EMB-ROs are given one (1) year from the issuance of this Circular to connect the said firms' DAHS to the EMB DAHS server.

The failure of major industries to transmit data from its CEMS/COMS to the EMB online information database system as stated under Department Administrative Order No. 2017-14 is considered a violation of the rules and regulations relating to the Philippine Clean Air Act and shall be punishable under Section 47 of Republic Act No. 8749.

SECTION 10. SEPARABILITY CLAUSE

If any provision of this Circular is declared not constitutional or not valid, the same shall not affect the validity of the other provisions.

SECTION 11. REPEALING CLAUSE

EMB Memorandum Circular No. 2020-003 is hereby superseded. All other issuances, orders, and instructions inconsistent herewith are hereby repealed or modified accordingly.

SECTION 12. EFFECTIVITY

This Memorandum Circular shall take effect fifteen (15) days after its publication in a newspaper of general circulation and upon acknowledgement of receipt of a copy thereof by the Office of the National Administrative Register (ONAR), UP Law Center.

Issued this 16th day of August 2021.

ENGR. WILLIAM P. CUÑADO
Director

ANNEX A

PREREQUISITES FOR FIRMS WITH CEMS / COMS TO EMB DAHS

The industry:
a. Has installed CEMS / COMS pursuant to DAO 2000 – 81 and DAO 2007 – 22;
b. Has to enter Memorandum of Agreement (MOA) between Third-Party Service Provider regarding Network Security and Data Privacy.
c. Has the necessary DAHS capable of interfacing with the EMB DAHS client-server application through TCP/IP, Virtual Private Network (VPN) or other secured data communication protocol as approved by the EMB;
d. Will allow the transmittal of CEMS / COMS data from the CEMS-DAHS to the EMB DAHS based on the settings prescribed by the EMB;
e. Will follow the prescribed diagram / framework for CEMS / COMS data communication. Please see Annex B;
f. Has a reliable internet subscription;
g. Will allow the communication of EMB DAHS on their network's firewall;
h. Will submit the following information to the EMB as part of the documentation needed for the EMB CEMS / COMS Registry;
    1. Company Name
    2. Address
    3. Names of Pollution Control Office (PCO) and Managing Head of the Company
    4. Contact Details (Contact Number and Official E-mail Address for the Alert Notifications)
    5. CEMS Details to include the following:
        • CEMS Type (extractive or in-situ)
        • Location of Installation
        • Brand and Model
        • Parameter Measured
        • Mode of Connection to DAHS (analog or digital)
i. Fixed IP address of DAHS which will transmit data to EMB DAHS.
j. Shall have procedures and protocols in cases of excess emission, pollution control device breakdown and other related emergency conditions that may affect the emission.
k. Data capture rate:
    75% of Hourly (minimum 45 mins / hr),
    Daily (minimum 18 hrs / day)
l. Data Loss guidelines:

    For internet failure: CEMS analyzer should be capable of storing the data without tampering. When the internet returns, the CEMS analyzer should be capable of immediately polling missing data to EMB DAHS.

    For System Breach: the firm should be equipped with local and cloud backup facilities.

    For power failure: Firm should be equipped with an Uninterruptable Power Supply (UPS) and other engineering means.
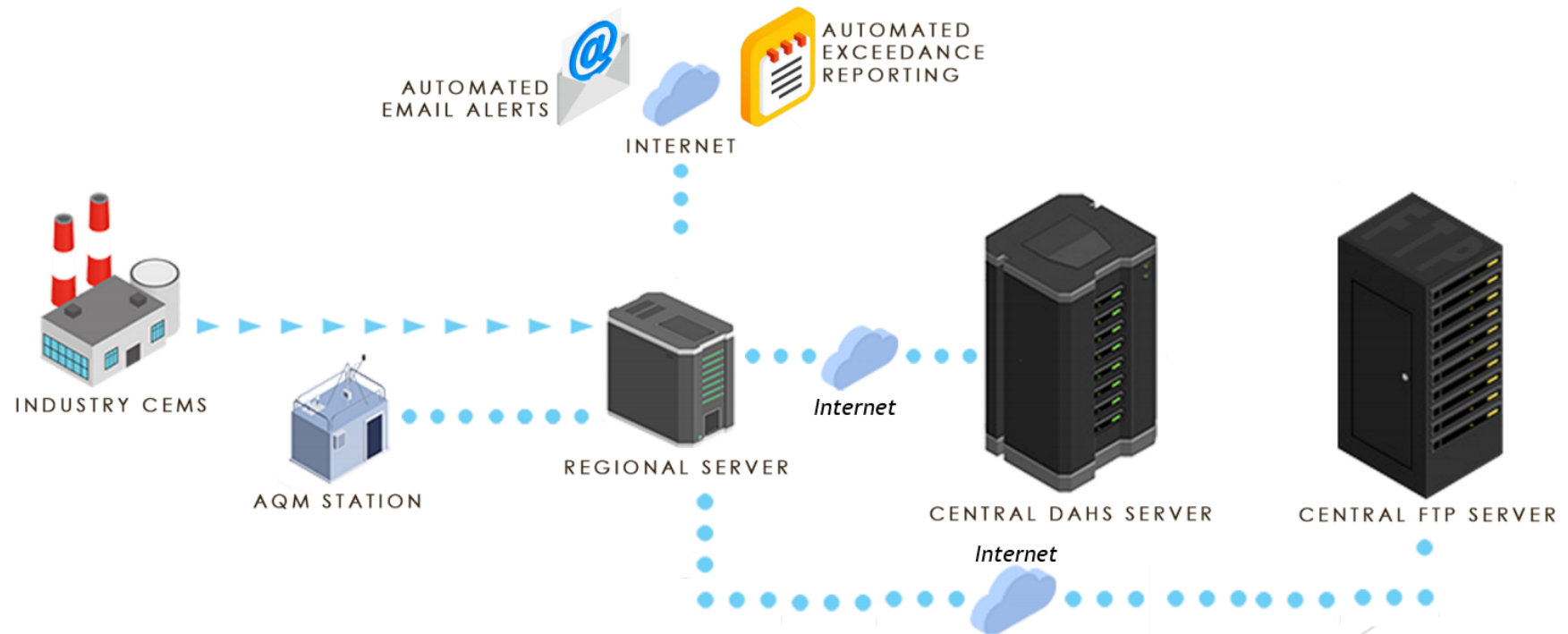
    For CEMS malfunction: the firm should conduct immediate stack sampling within 5 days. Subject to EMB audit.

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ANNEX B

PRESCRIBED FRAMEWORK FOR EMB AIR QUALITY NETWORK OPERATION CENTER

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ANNEX C

DATA HANDLING OF CEMS/COMS EXCEEDANCES

Calculation of CEMS/COMS concentrations, such as arithmetic average of 3 contiguous hour of Sulfur Oxides (SOx as SO_2)   into the EMB-DAHS, use the positive integer part. Truncate any decimal parts.

Example: 150.5 mg/Nm^3 truncates to 150 mg/Nm^3
150.999 mg/Nm^3 truncates to 150 mg/Nm^3 **Compliant with 150mg/Nm^3Std**

151.001 mg/Nm^3 truncates to 151 mg/Nm^3
151.816 mg/Nm^3 truncates to 151 mg/Nm^3 **Failed the 150 mg/ Nm^3Std**

ANNEX D
DATA TRANSMISSION

1. **Opacity (any rolling five-minute period)**

   e.g:

   30 % Opacity Exceedance No.1 for Day 1:
   8:05AM to 8:10AM

     5-minute exceedance (1 hour average is composed of 12 X 5-minute reading)
   (reported 8:10AM)

   30 % Opacity Exceedance No.2 for Day 1:
   9:10AM to 9:15AM

     5-minute exceedance (1 hour average is composed of 12 X 5-minute reading)
   (reported 9:15AM)

   Note: Show cause order (SCO) reported for Day 1, showing Exceedance No.1 and No.2

   Exemption: As per Section 2 (b) of Rule XXV of DAO 2000-81-Visible Emission Standards for Smoke and Opacity, exceptions to the requirements stated herein may be allowed under the following circumstances:

   1. The opacity limit hereinbefore prescribed shall not apply to the emission of dark smoke for less than five (5) minutes in a period of one (1) hour provided that the total period of such emission shall not exceed an aggregate of fifteen (15) minutes in any twenty-four (24) hours;

   Scenario 1: Day 1

   Opacity=21% (0400 -0404); 30%(0415-0418); 45%(0445-0448)

   Opacity Exceedance >20% = 4 minutes+ 3minutes+3Minutes= 10 minutes

   Evaluation: < 5minutes per occurrence; within 1 hour; < 15 minute Aggregate, within 24 hour cut off

   Scenario 2: Day 2

   Opacity=23% (0400 -0406); 32%(0410-0418); 41%(1200-1207 –Sept 13,2020)

   Opacity Exceedance >20% = 6 minutes+ 8 minutes+7 Minutes=21 minutes

   Evaluation: <>5minutes per occurrence; not within 1 hour ; > 15 minute Aggregate, passed 24 hour cut off (0000 to 1200)

2. **Particulate Matter (PM) any rolling one-hour average, reported every 5-minutes**

   e.g:

   Exceedance No.1 for Day 1: 300 mg/Nm³
   8:05AM to 9:05AM

     1 hour exceedance (1 hour average is composed of 12 X 5-minute reading)
   (reported 9:05AM)

Exceedance No.2 for Day 1: 206 mg/Nm³
 8:10AM to 9:10AM
 1 hour exceedance (1 hour average is composed of 12 X 5-minute reading)
 (reported 9:10AM)

Exceedance No.3 for Day 1: 345 mg/Nm³
 9:10AM to 10:10AM
  1 hour exceedance (1 hour average is composed of 12 X 5-minute reading)
 (reported 10:10AM)

Exceedance No.4 for Day 1: 230 mg/Nm³
 1:10AM to 2:10AM
 1 hour exceedance (1 hour average is composed of 12 X 5-minute reading)
 (reported 2:10AM)

Note: *Show cause order (SCO) reported for Day 1, showing Exceedance No.1, No.2, No.3, and No.4.*

3. **Oxides of Sulfur as Sulfur Dioxide (SO$_X$ as SO$_2$ and NO$_X$ as NO$_2$) : (any arithmetic average of three contiguous one-hour periods, reported every 5-minutes);**

e.g:

Exceedance No.1 for Day 1: 900 mg/Nm³ New Source, Fuel Burning
 8:05AM to 11:05AM
  3 hours exceedance (3-hour average is composed of 3 X 12 X 5-minute reading)
 (reported 11:05AM)

Exceedance No.2 for Day 1: 830 mg/Nm³ New Source, Fuel Burning
 8:10AM to 11:10AM
  3 hours exceedance (3-hour average is composed of 3 X 12 X 5-minute reading)
 (reported 11:10AM)

Exceedance No.3 for Day 1: 930 mg/Nm³ New Source, Fuel Burning
 1:10PM to 4:10PM
 3 hours exceedance (3-hour average is composed of 3 X 12 X 5-minute reading)
 (reported 4:10PM)

Note: *Show cause order (SCO) reported for Day 1, showing Exceedance No.1, No.2 and No.3*

4. **Carbon Monoxide (CO) (any rolling arithmetic average of four contiguous one-hour, reported every 5-minutes)**

e.g:

Exceedance No.1: 1,130 mg/Nm^3
 7:05AM to 11:05AM

4 hours exceedance (4-hour average is composed of 4 X 12 X 5-minute reading)
(**reported 11:05AM)**

Exceedance No.2: 930 mg/Nm^3
 7:10AM to 11:10AM

4 hours exceedance (4-hour average is composed of 4 X 12 X 5-minute reading)
(**reported 11:10AM)**