Online Monitoring Systems

(March 19th, 2016)

CENTRAL POLLUTION CONTROL BOARD

Regulatory Regime

- Consent orders of SPCBs/PCCs specify standards to be complied by industries
- Industries submit analysis reports to SPCBs/PCCs and invariably copies are marked to CPCB
- Reports submitted by industries largely comply with the consent standard limits in contrast to the samples collected by SPCBs/PCCs/CPCB that by and large remains non complying.
- Actions (based on manual monitoring methodology) against industries are not leading to improvement in treatment processes by the units besides the persistent defaulters remains non committal.

Regulatory Regime (contd.)

- Monitoring mechanism is weak due to lack of logistics, manpower and resources among the SPCBs/PCCs/CPCB obviously due to vastness of the jurisdiction area for regional offices and Zonal offices.

- Remedy is to put in place alternate monitoring mechanism on self monitoring methodology by industries and provide online data to regulatory regime.

National Policy on Online Monitoring

In “National Environment Policy” it is envisaged that to strengthen the testing infrastructure and network for monitoring ambient environmental quality and progressively ensure real-time, and online availability of the monitoring data

Background

- Central Pollution Control Board issued directions for setting up of Real Time Monitoring Systems .

Real Time Monitoring System – Why

- Self Monitoring mechanism within the industries
- Increased management responsibility for regulatory compliance
- Increased cost-effectiveness
- Fast corrective action
- Improved control over impacts on the environment
- Higher environmental awareness
- Increased public access to information

Guidelines for RTMS

- RTMS equipped to analyse specified parameters at a defined frequency.
- RTMS consist of standalone unmanned monitoring stations equipped with modem for transmission of real time data to a Central Receiving Station(CRS)

Guidelines for RTMS (contd.)

- CRS located at industrial unit/service provider/SPCBs and CPCB.
- CRS capable to receive, analyze and archive the data received from RTMS with alarm system.
- Delayed Checks of data generated through RTMS with manual monitoring to assess the efficacy, accuracy, precision and reliability of equipment's.

Monitoring Systems operated by Industries

Air Pollution Monitoring System

- Emission Monitoring Systems
- Ambient Air Quality Monitoring Systems

Ambient Air Quality Monitoring Station

Water Pollution Monitoring System

- Effluent Monitoring Systems

Measuring Systems

S. No.	Technology	Gases Measured
1.	In-Situ – Cross Stack	Many using IR or UV
1.1	In-Situ – Cross Stack	NH_3, HCL using Laser
2.	In-Situ – Folded Beam	SO_2, NO_X, CO, CO_2
3.	Extractive – Cold Dry	SO_2, NO_X, CO, CO_2, HC
4.	Extractive – Dilution	SO_2, NO_X, CO, CO_2, HC
5.	Extractive – Heated	Typically all Gases, specially NH_3
6.	Extractive – Dry	Typically all Gases
7.	Extractive – EC	Typically all Gases

Online Effluent Monitoring

Monitoring Station

Jajmau Bridge Kanpur-Fixed

Varanasi Downstream-Floating

Automatic Water Quality Monitoring of River Ganga

Technologies for Effluent Monitoring

Parameters	Technologies
pH	Electrode /Electrochemical method
TSS	Scattered Light Method (IR) Nephelometry Method

TECHNOLOGIES FOR EFFLUENT MONITORING

Parameters	Technologies
COD, BOD, TSS	• **UV Spectrophotometry (Single/two/four wavelengths)** • **UV-Visible Spectrophotometry** • **(Single Beam)** • **UV-Vis Spectrophotometry (Double Beam)**
TOC (Co-relation with BOD & COD)	• **Combines Combustion CatalytiC Oxidation at 680°C and NDIR Method** • **UV Persulfate NDIR Detector** • **Persulfate Oxidation at 116-130 Deg C NDIR Detector**

TECHNOLOGIES FOR EFFLUENT MONITORING

Parameters	Technologies
COD	**Measuring COD using ($K_2Cr_2O_7$) + Calorimetric**
NH3	• Colorimetric (645-655nm) • Ion Selective Electrode method With temp correction • UV Absorbance or Multiple Wavelength UV Absorbance Spectrophotometers (200-450nm

TECHNOLOGIES FOR EFFLUENT MONITORING

Parameters	Technologies
Chromium	Colorimetric method Reaction of Cr-VI with di-phenyl carbazide in acid solution Voltammetry (Anodic Stripping Voltammetry)
Chromium Hexavalent and Trivalent	Dual Beam UV-Visible Spectrophotometry
Arsenic	Voltammetry (Anodic Stripping Voltammetry)
Besides the above there are Systems/Technologies	many other Monitoring available

Status of Real Time Monitoring Systems

Emission/effluent Monitoring System

- System installed : approx. 1530
- Systems connected : approx. 1220
- Systems under installation : approx. 800

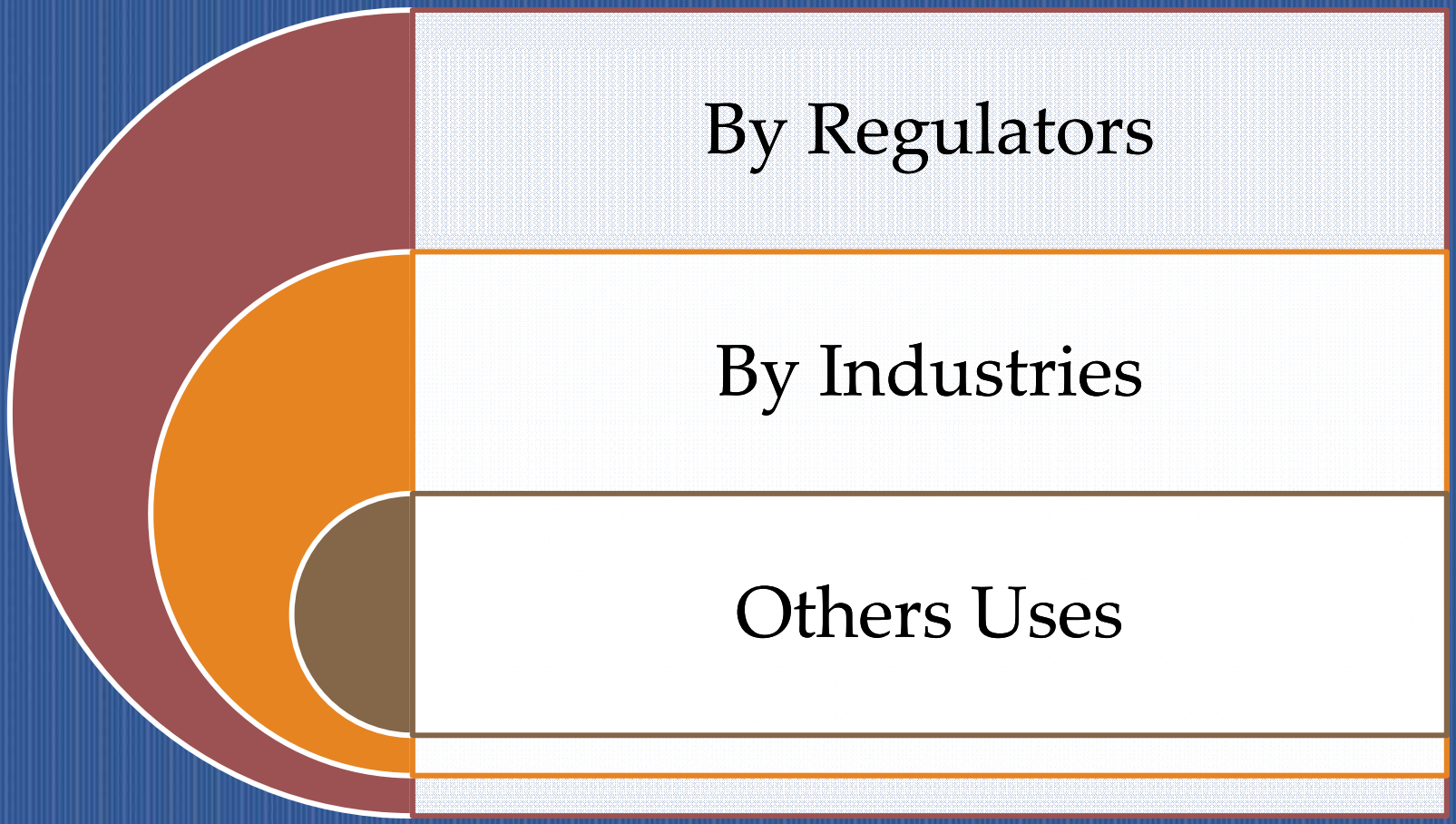
Water Quality Monitoring System

- Installed : 10 Proposed : 113

Ambient Air Quality Monitoring Systems

- Installed : CPCB/SPCB/Industries : More than 200

Use of Real-time Environmental Data



Use of Real-time Environmental Data

By Regulators

A
- Regulatory Compliance
- Pollution Prevention and Control

B
- Policy Designing, Planning and Siting
- Mitigation and Response

C
- To Keep Track of Project / Program Success
- Cleanup and Remediation Science

Use of Real-time Environmental Data

By Industries

- To Avoid Non-Compliance
  - Real-time Data Acquisition & Analysis Tools
- Market Trading Systems
  - Responsible Corporate Citizenship
- Leveraging Enterprise + ERP Systems

Use of Real-time Environmental Data

Other Uses

- Integration of Real-time Environmental Data with GIS
- Study Impact of Pollution and Benefits and Costs of Pollution Control Measures
- Use by Common People to know Environmental Impacts and Awareness

Thank You