CEA-JCOAL Workshop FY2019

Indian FGD – Commissioning & Performance Test requirements at Coal-fired Power plants

Chugai Technos Corporation, Japan

Smart Life Engineering

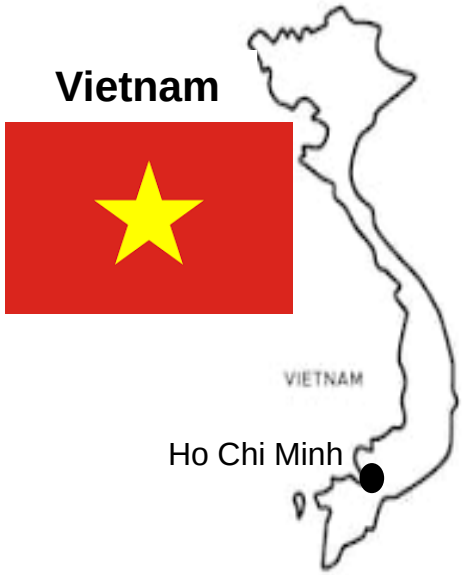
Smart Technology, Smart Future

Company Network Profile

Japan

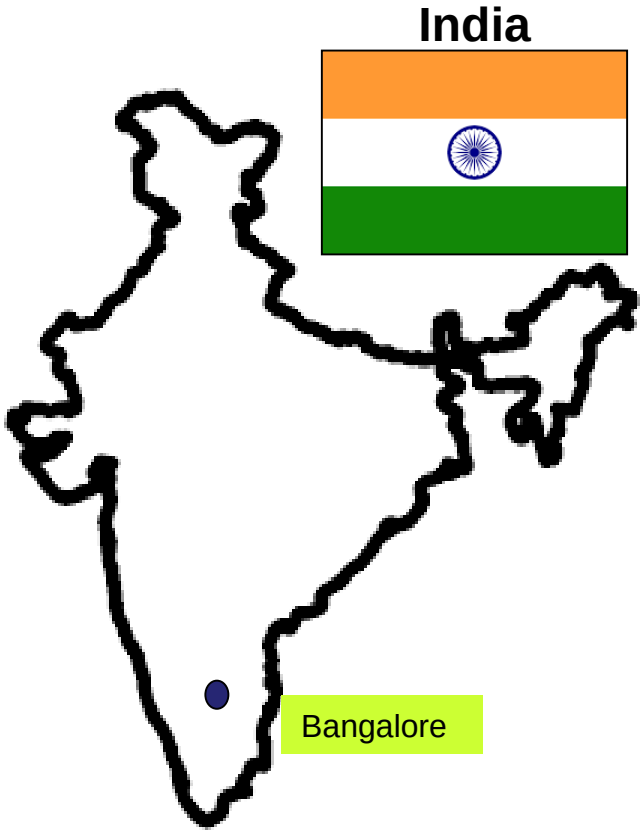
Established : 1953
Employees : 983
Branches : 20

Vietnam



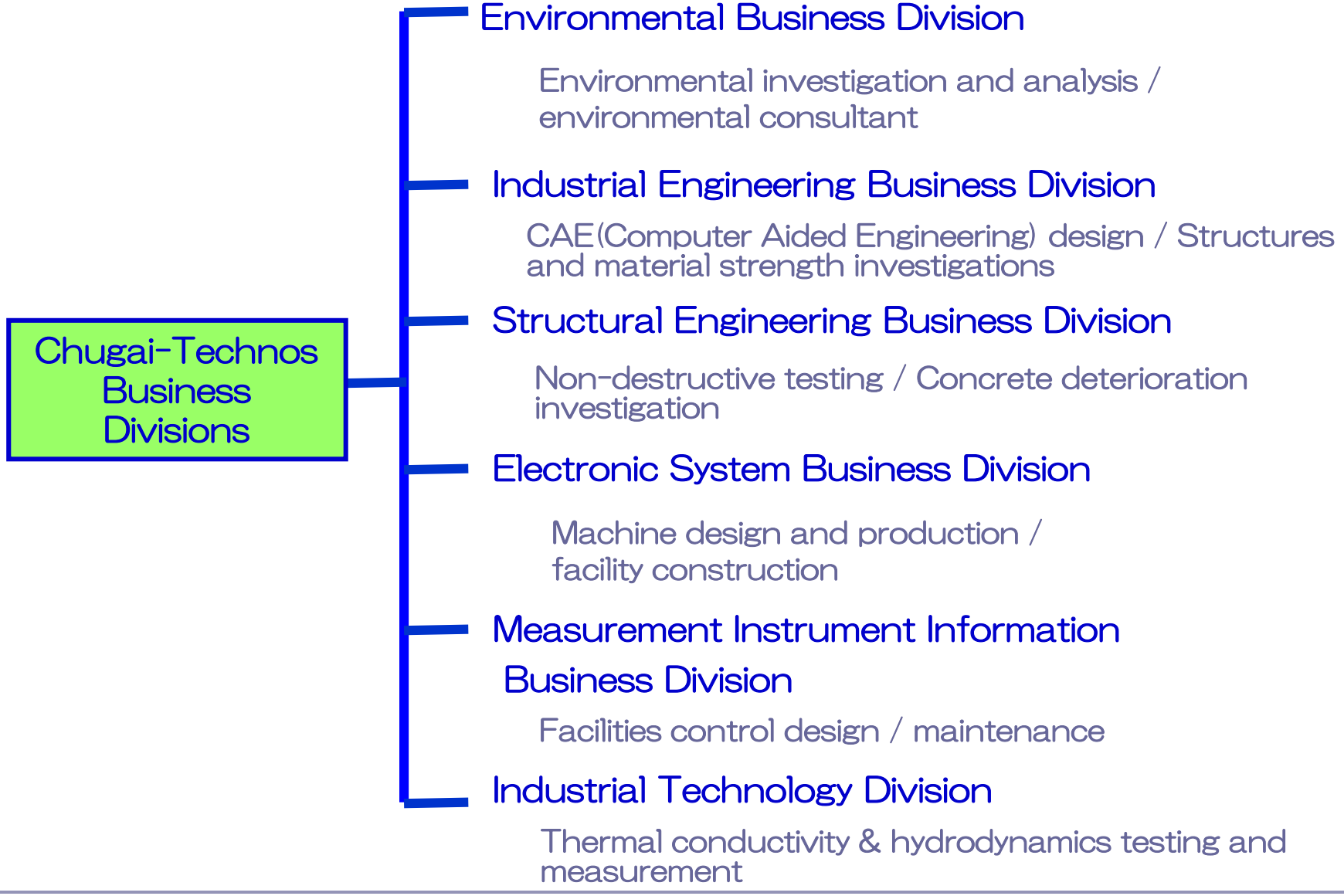
Established : 2014
Employees : 20

India

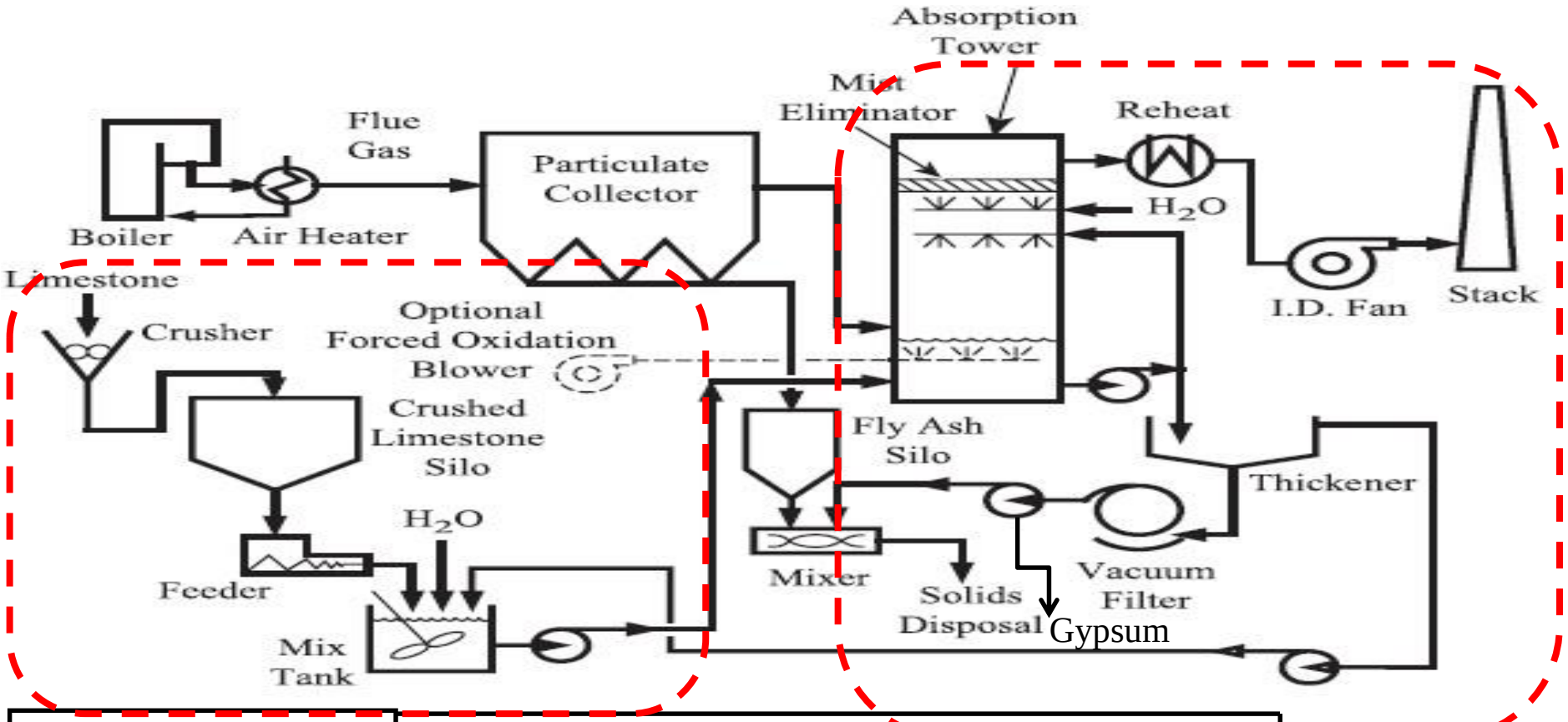


Planning for 2020

Business Division



Chemical engineering involved in flue gas treatment



Unit Operation

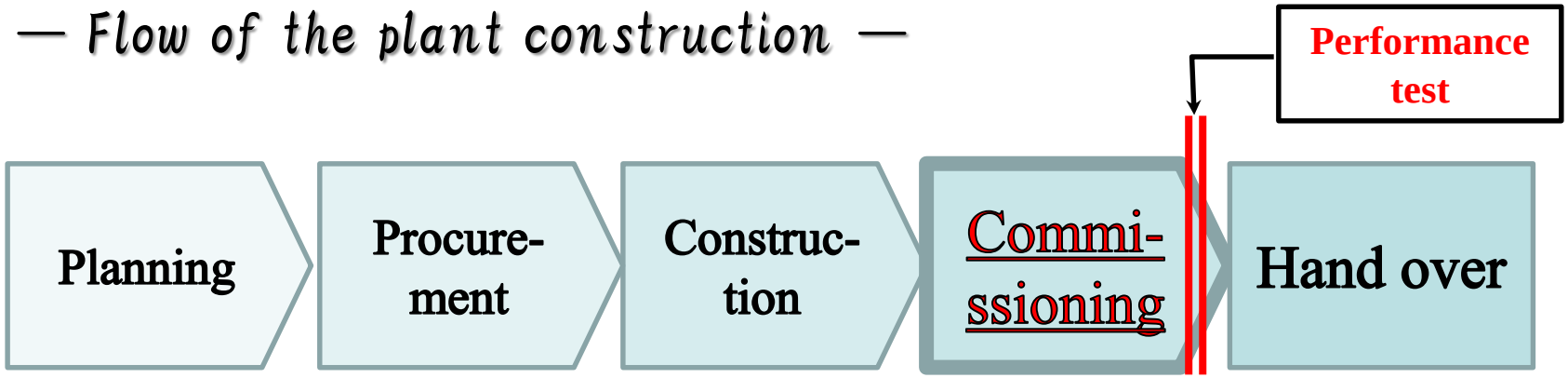
Solid Catalytic reaction, Dust Collection / Classification,

Flow, heat transfer / evaporation, humidity control, stirring / mixing Gas absorption, gas-liquid contact operation, crystallization, filtration

Drying, distillation, adsorption / ion exchange, membrane separation, coagulation / sedimentation / filtration

Role of Chugai in Chemical Engineering

— *Flow of the plant construction* —



1. Role in Commissioning Test

Adjustments are required in different Units; finalization of adjustments are verified by out come of chemical testing.

Usually these process carried out for 3 months in commissioning.

2. Role in Performance Test

Third party confirmation & MoU with FGD makers to final guarantee of unit operation.

Usually these process carried out for 10 days in commissioning.

Performance Test

Standard Methods : ASME PTC-40
Guidelines : FGD Manufactures (Technical Specifications)

a
- Percentage removal of SO_2

b
- Stoichiometric ratio particulate emission

c
- Energy/Power consumption

d
- Water characterization

e
- Reagent consumption / Characterization

f
- Waste & By-product production and characterization

Dust Concentration

Inlet & Outlet Duct

Long Size Pitot Tube for Flow Rate Measurement

Leak Ammonia at SCR System

CO_2, O_2 and N_2 Measurement by Orsat

PG Test – Air Monitoring

Sampling with expertise

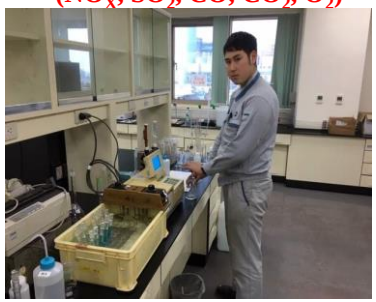
Methods US EPA, EPRI, ASTM & JIS

Reports delivered as per standard procedures

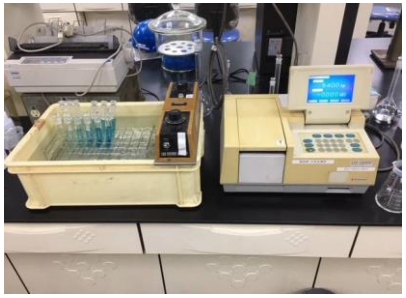
Sampling Unit

High Perfomance Monitoring System 5 conponets analyzer (NO_X, SO_2, CO, CO_2, O_2)

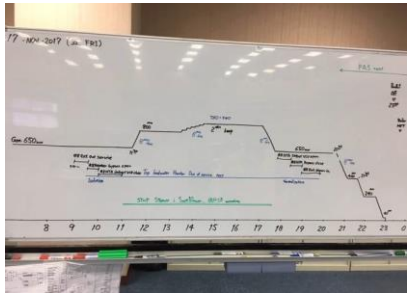
Environmental Measurement at Stack



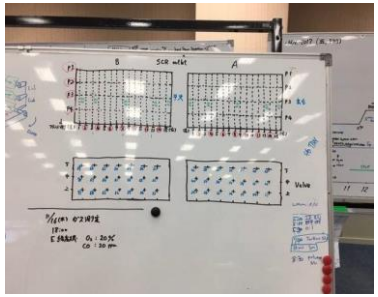
Site Analysis



Leak Ammonia Analysis

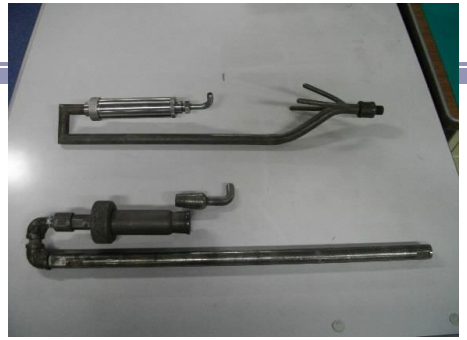


Confirmation of Test Process in the Central Control



Result Report

Dust holders



Glass Dust holder

Sampling Probe 4m Length

Sampling Equipment

Special probes for specific parameters

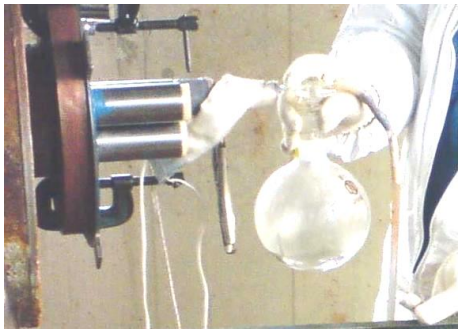
Inbuilt technology for SO_3 monitoring

Mist Eliminator – Mist exhaust level checking

SO_2 Sampler

Mist Moisture Sampler

Moisture Sampler

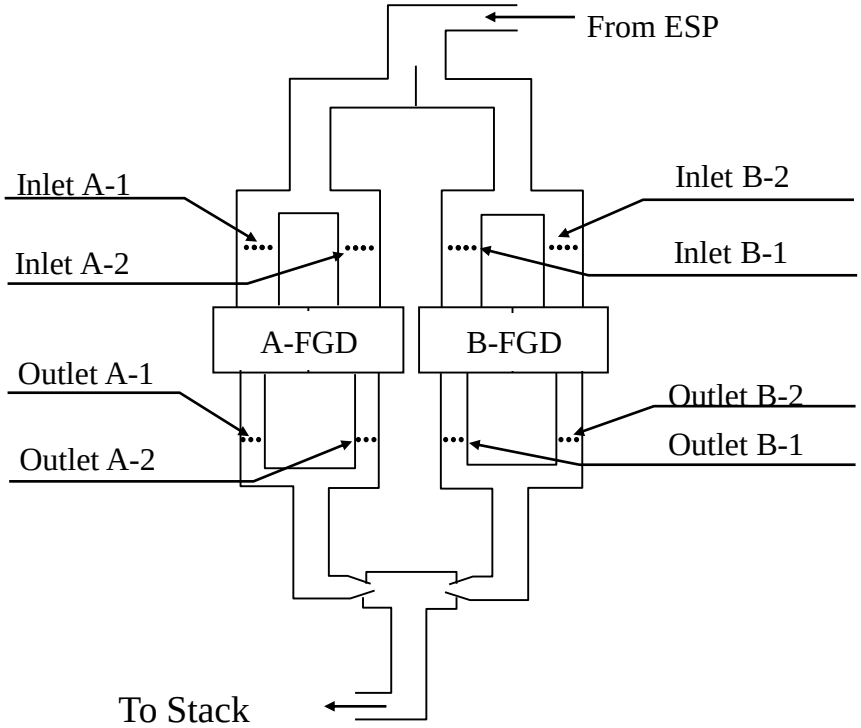


NO_X Sampler

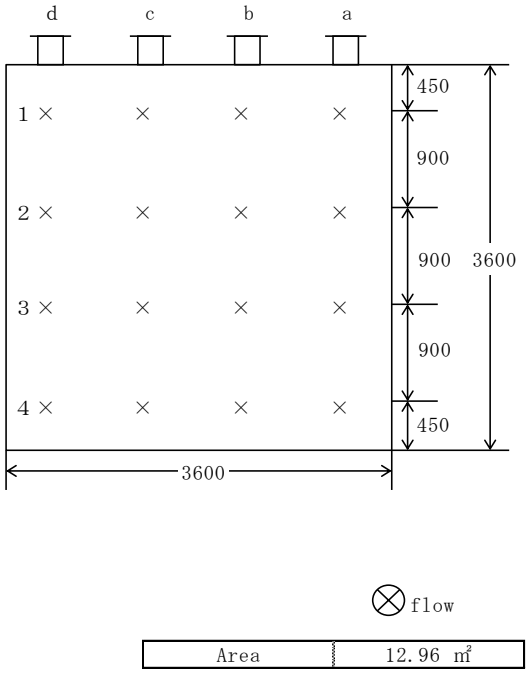
SO_3 Sampler

Performance Test Sampling

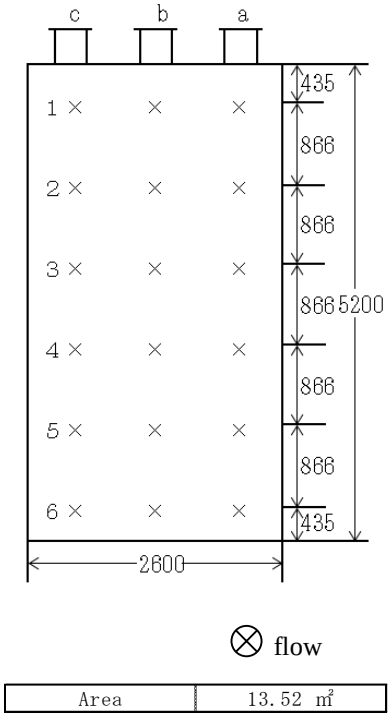
Example of large FGD duct at coal power plant



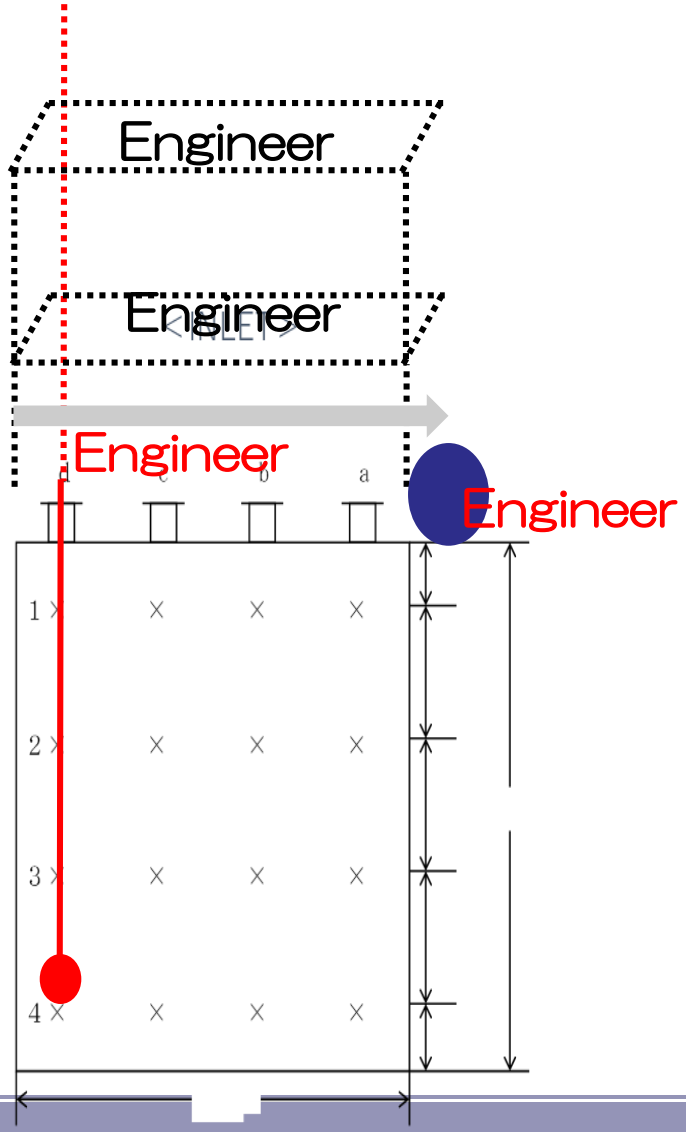
<FGD Inlet>



<FGD Outlet>



Vertical Duct Monitoring



INLET

Minimum 4 engineers will be required.
2 (Red) well experienced engineers and
2 worker level.

One Japanese Engineer :
Complete management & Gas meter adjustment.

One Technical Engineer :
Sampling at traverse points

Two Assistance :
Supporting Technical Engineer

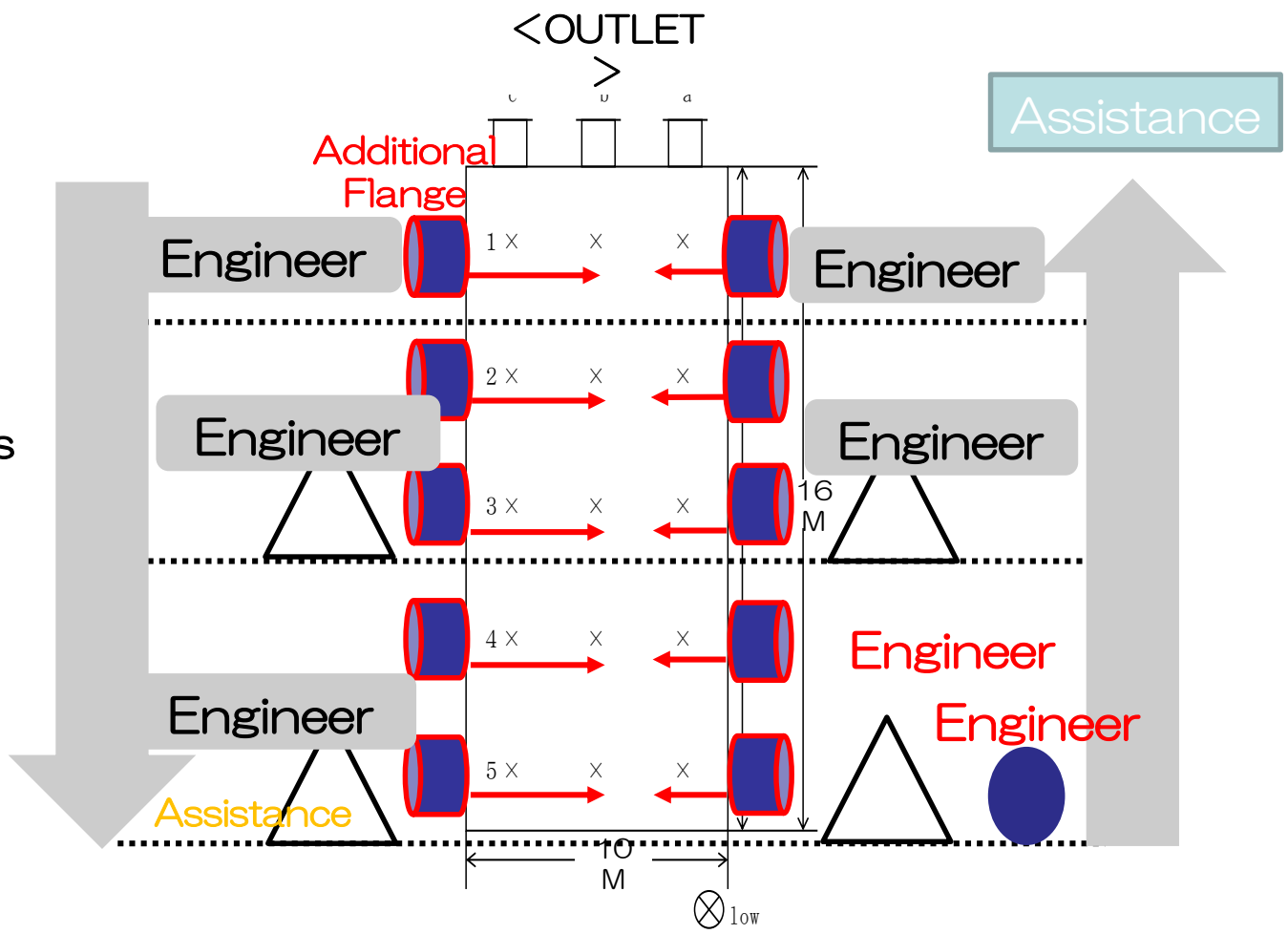
Horizontal Duct Monitoring

Totally 5 Engineers are required

One Japanese Engineer : Complete management & Gas meter adjustment.

Two Technical Engineer : Sampling at traverse points

Two Assistance : Supporting Technical Engineer



Samples involved

- Flue gas (Inlet & Outlet)
- Lime stone
- Lime stone slurry
- Re-circulation slurry
- Gypsum
- Water & Waste water
- Re-circulation water

FGD Operational issues

- Poor SO_2% removal
- Poor Chemical reagent utilization
- Limestone blinding
- Poor Gypsum quality
- Scaling
- Mist eliminator pluggage
- Mist exhaust from stack

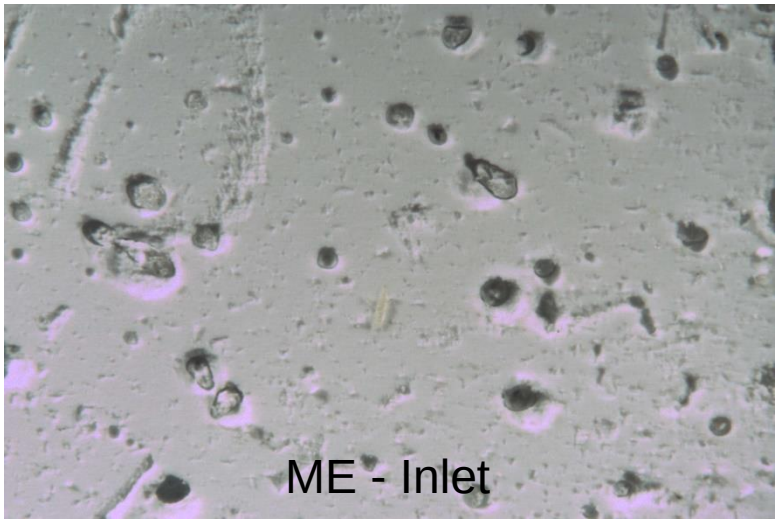
Regular chemical process monitoring required in O&M activity

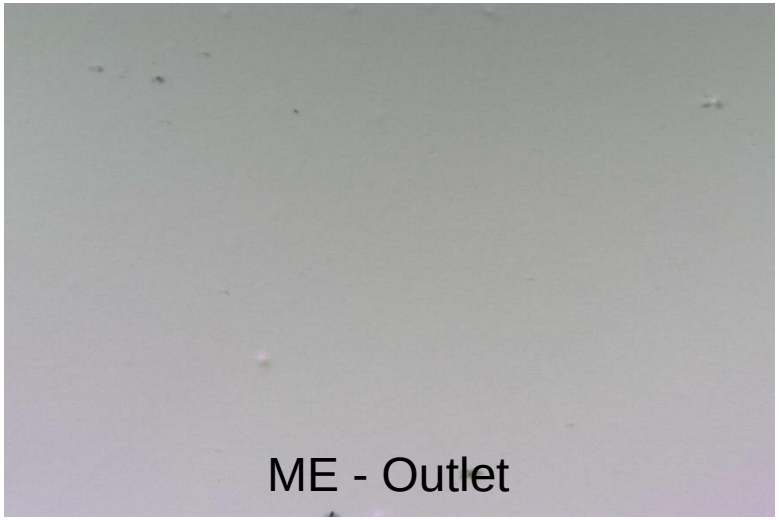
Mist Size check : Mist Eliminator

Issues in Exhaust Gas from FGD

i. Low dispersion of pollutants
ii. Visibility of plume after stack emission
iii. Liquid droplet rainout from the stack, and
iv. Corrosion problems on downstream materials.

Chugai`s Method : MgO Plated sheet sampling





Mist size : Min. 0~20μm to Max. 500μm

Thank you very much for your kind attention

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Chugai Technos

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http://www.chugai-tec.com/