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Method Statement

Air Emissions Monitoring of the Generators

Client

Ramla Bay Hotel

Site

***Ramla Bay, L/O Cirkewwa, Mellicha
Perkins Generator - 660kVA***

Introduction

This method statement has been prepared to highlight the principles used by NBEngineering Services Employees when performing Flue Gas Emission Monitoring on Industrial Sites.

Competency

The engineering staff deployed on the job have been trained in both theory and practice of flue gas monitoring and handling of emission equipment. They have over 24 months training and experience in the field. For large industrial Clients, the job may be handled by two personnel working as a team, and not a single person.

Client Requirements

It is expected that the Client would allocate a local site staff member to the NBEngineering team in order to show the whereabouts of the various auxiliary equipment. This staff member must be a first aider, must know the best and safest way to access the auxiliary equipment, must be able to operate the same equipment under test, and must have a reliable means of communication with the Central Control Room of the Plant at all times. The operating of all Auxilliary Equipment must be done by the Client's nominated member of staff only.

The Client must also prepare a 10mm diameter access hole in the horizontal plane, in the various exhaust ducts/ chimneys as indicated by the NBEnginnering personnel (if none are already available) for means of accessing the exhaust gases. These sampling holes must be closed off by the staff after the samples have been taken.

The Client uses Diesel Oil to fuel the equipment under consideration. Due to this fact we believe that the measurement of dust is not necessary, since dust measurement is usually associated with the combustion of heavy fuel oils such as those with viscosity of 450secs and higher.

Pre-Test Requirements

The Client and NBEEngineering personnel shall inspect all access platforms, ladders and approach scaffolding required for the job prior to use. The Client must issue safety certification of all tools / ladders to be used prior to the arrival of NBE personnel. Any insulation that must be removed for the sampling process must be done so prior to arrival of NBE personnel. Ladders must be capable of 150kg capacity, and scaffolding must be rated for 200kg point loading certified. A qualified engineer from NBEEngineering shall carry out a pre-work risk assessment to identify any issues at hand from an access point of view.

Prior to Arrival on Site

The Client is to confirm in writing that the pre-test requirements have been met and a list of certified equipment is to be presented by email.

Arrival on Site

An agreed date and time will be kept. NBE personnel will await the arrival of the Client site nominated employee at the site gate house for entry. The Client must prepare for NBE vehicle permit to site.

The results of the pre-work risk assessment should be discussed with all members of the team prior to commencement of work. NBE personnel shall have the appropriate PPE and tools for the job.

At the Sampling Location

The area in the vicinity of the sampling point must be cordoned off and adequate signage installed by the Client to indicate the operation of Auxiliary Equipment for testing purposes. Where work at height is being done, signage must also indicate this.

The flue gas analyzer to be used weighs less than 10kg so we don't envisage issues with handling equipment to the sampling point.

The flue gas sampling kit requires 5 mins initialization. The probe must always be put in the central position of the stack / duct.

All sampling points must have adequate ventilation in the immediate vicinity. Where not, the Client must prepare masks for NBE employees.

The equipment to be used by NBE personnel shall be calibrated. A copy of the calibration certificate shall be provided with the results.

NBE personnel shall be using the following equipment, with the following emissions components:

Testo 340

O₂, CO, NO_x, CO₂, NO_x, SO₂, Flue gas temperature, Velocity

The Testo 340 Methodology is based upon DIN EN 50379-1 and DIN EN 50379-2

The Limits of Detection for the Testo 340 are as follows:

	Minimum	Maximum
CO: Concentration	0 ppm 0 mg/Nm ³	10000 ppm 12476 mg/Nm ³
NO:	0 ppm 0 mg/Nm ³	3000 ppm 4009 mg/Nm ³
NO ₂ :	0 ppm 0 mg/Nm ³	500 ppm 1024 mg/Nm ³
SO ₂ :	0 ppm 0 mg/Nm ³	5000 ppm 14268 mg/Nm ³

Dust shall not be measured due to the nature of the fuels currently being used on site, namely diesel oil (EN590).

A print out of the results at each sampling point will be taken and shown to the Clients representative. This will be signed by one of the NBE personnel at the sampling point.

The sampling point is to be closed off prior to leaving the area. Setting up of next sampling point to commence thereafter.

The sampling point shall be chosen such that it is at least 4 exhaust pipe diameters away from the engine exit point, preferably in a straight length of exhaust pipe. Site conditions may require further consideration. If a sampling point already exists, this may also be used. A photo of the sampling point to be included in the test report.

Sampling Procedure.

- Coordination with control room that system shall be disturbed
- Start up generator, leave idle for 5 mins
- Increase power to full load conditions and leave for 2 mins
- Place probe inside the duct and sample flue gas until CO / NO_x reading is steady.
- Record result, and remove probe.
- Leave in operation at full load another 2 mins.
- Place probe inside the duct and sample flue gas until CO / NO_x reading is steady.

- Record result, and remove probe.
- Leave in operation at full load another 2 mins.
- Place probe inside the duct and sample flue gas until CO / NO_x reading is steady.
- Record result, and remove probe.
- Reduce power to idle condition and stop the engine as per Manufacturer's instructions.

Emergency response procedure

In the unlikely event of an emergency / accident which means that one member of the team falls ill, becomes overcome by the exhaust gases, falls or cannot get down to a ground level from an elevated position, the Client must immediately activate his own emergency procedures which should include site first aide, ambulance response and all means necessary to ensure timely evacuation.

Back at office

Site reports will be processed to standardize the reporting conditions, namely temperature of 273.15K, pressure of 101.3kPa and O₂ content of 15%. The average of the three samples shall be taken.

Duplicate copies will be prepared, with the Client receiving the original report and a copy.

This will be done within 5 working days of the sampling date.

The reports will be signed off by the Technical Manager of NBEngineering Services Ltd.

Gas Flow Rate Calculation

The instrument can also measure the flow velocity at the sampling point. An average flow rate may then be calculated based upon the three measured samples. Measurement of the cross-section area of the ductwork at the sampling point will then be carried out, and hence we can deduce the flow rate. The Client would have to indicate the yearly operating hours of the engine, and we can then calculate the yearly production of pollutants.

The nominated inspector for this project will be Ing. Nicholas Bellizzi

Position of sampling point



Diameter of exhaust pipe: 100 - 125mm

Sampling point is 250mm from exhaust port.

