

Guidelines on Application for Installation of Emergency Generators

1. Introduction

- 1.1. This guidance note is intended to spell out the environmental requirements to facilitate the developers, architects, consultants and contractors in making applications for installation of emergency generators.
- 1.2. The following outline the requirements for submitting an application under Air Pollution Control (Furnaces, Ovens and Chimney) (Installation and Alteration) Regulations in relation to installing emergency generators as well as any additional mitigation measures that should be taken. The objective is to secure a good planning practice to minimize emissions and ensure good dispersion such that the products of combustion emissions from the emergency generators will not pose a potential pollution to the nearby receptors.

2. Mandatory requirements for installation

2.1. Fuel consumption rate

Emergency generator is generally power-driven by diesel engine(s). All emergency generators consuming more than 25 litres of conventional liquid fuel shall require prior approval from EPD for the chimney at least 28 days before the commencement of installation work. The owners and operators are legally bounded to submit such application under Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alteration) Regulations.

2.2. Specified Process

In case the total power generation capacity of all the diesel generators, physically and electrically connected, in the same premises exceeds 5MW, the establishment is liable to be controlled under a Specified Process licence for the operation. Please refer to Electricity Works in Schedule 1 of the APCO for relevant requirements.

3. General Requirements

Applicants are required to provide the following relevant information in the plans and specifications of the proposed emergency generator installation:-

- (a) indicate the position of the emergency generator in a layout plan drawn to a scale of not less than 1:100;
- (b) indicate the site location, along with exhaust outlet, in a block plan drawn to a scale of not less than 1:500;
- (c) show in the submitted plan the hourly fuel consumption rate for each emergency generator and the grade of the fuel that complies with the requirements of the Air Pollution Control (Fuel Restriction) Reg. i.e. sulphur content of the fuel is not exceeding 0.005% by weight and the viscosity not exceeding 6 centistokes;
- (d) provide the diameters and arrangement of the flues/chimneys serving the generator(s) in a layout plan and in plans (drawn to a scale of not less than 1:100) showing the elevations in different perspectives (front and side elevations, plan etc.);
- (e) demonstrate with relevant drawings and statement that the outlets of the flues/chimneys are at least 5 m from the surrounding sensitive receptors such as openable doors / windows, canopy, balcony, as well as any fresh air intake point of the HVAC system (Refer to Section 4.1 for further details);
- (f) direct the exit of the flue(s) / chimney(s) vertically upward without rain caps; (g) provide the name and the address of owner(s) of the emergency generator(s); (h) provide the detailed particulars of the generator(s) such as its/their catalogue(s) and indicate in the submitted plan the brand name, model, fuel consumption rate and capacity of the generator(s);
- (i) all plans shall be signed (except the block plan) by a qualified engineer that is a registered professional engineer in the building services, gas, chemical, marine or mechanical engineering disciplines under the Engineers Registration Ordinance (Cap. 409). Layout plan and plans showing the elevations are to be prepared by either an authorized person or a qualified engineer; chimney structural details and block plans are to be prepared by authorized person; and
- (j) submit two (2) sets of plans;
- (k) other special requirements may be deemed necessary for individual case.

4. Specific Requirements

The above paragraphs have highlighted the basic requirements which are to be fulfilled for obtaining approval. For certain circumstances where the proposed installation may very likely cause pollution to the nearby residents, the approving authority will strongly advise the applicants, the consultants and contractors concerned to implement additional mitigation measures that would help ease the potential impacts.

4.1. Positioning of chimneys (exhaust outlets)

Prevention is better than cure for a pollution problem before it emerges. It is highly desirable to locate the exhaust pipe outlet (preferably with the generator sets sited to the uppermost floor) at the building roof rather than at low level or the podium.

Should it be not viable, it is essential to locate the chimney or exhaust outlet of the generator in an appropriate manner having regards to the following principles:

- (a) The exhaust outlets should be sited at such a place where the ventilation is good and in such a manner that the emissions from them can be adequately dispersed without hindrance; and
- (b) These exhaust outlets should be distant from the nearby inhabitants as farthest as possible such that their emissions will not cause or contribute to any forms of air pollution.

In particular, it is crucial to ensure that the waste gases will not be discharged into poorly ventilated zones, such as enclosed carparks, alleys, courtyards and lightwells, etc..

To avoid unnecessary delay, the applicants should submit their application at the very earliest of the planning stage so as to allow ample time for exploring an alternative routing for the chimney as well as location of plant room in case those originally proposed not considered acceptable.

4.2. Additional mitigation measures

Under circumstances where emissions from the flue(s) or chimney(s) may pose foreseeable pollution to the nearby receptors, say, exhaust outlets immediately above the

podium levels of residential developments, the application will only be approved upon satisfactory demonstration by the applicants on the provision of effective air pollution control measures to alleviate the impacts. Such additional mitigation measures may include:

- * **Catalytic converter** – typically a stainless steel box mounted in the exhaust system fitted with an autocatalyst (a ceramic or metallic substrate with an active coating incorporating alumina, ceria and other oxides and combinations of the precious metals - platinum, palladium and rhodium).
- * **Diesel particulate trap filter (soot trap)** – consist of a filter material positioned in the exhaust designed to collect solid and liquid particulate matter emissions.
- * **Use of ultra low sulphur diesel (ULSD)** – it is always desirable to use ultra low sulphur diesel (ULSD of at least 0.005% sulphur content), in particular in urban areas, for reducing the amount of sulphur dioxide to be emitted. The extra cost is expected to be comparatively very small.

It is important to note that whenever catalytic converter is to be installed, the ULSD must be used so as not to poison the converter due to the presence of sulphur in the fuel.

In addition, there have been growing advanced technologies available in the marketplace supplying the best pollution control products. Most equipment suppliers offer a wide array of proven designed products to meet the specific requirements. The applicants may provide relevant supporting documents to substantiate their claim for comparable or superior performance of any other effective control equipment in their application for EPD's consideration.