

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 developers, architects, consultants and contractors in making applications for installation of emergency generators which are used to provide emergency electricity supply for the premises during main power failure.
- 1.2. The following outlines the requirements for submitting an application under Air Pollution Control (Furnaces, Ovens and Chimneys) (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 emitted from the emergency generators will not pose a potential pollution to the nearby sensitive receptors.

2. Mandatory Requirements for Installation

2.1. Fuel consumption rate

Emergency generator is generally driven by diesel engine(s). If the occupier of any premises intends to install the associated flue/chimneys for emergency generators consuming a total of more than 25 litres of conventional liquid fuel, he / she shall require to have prior approval from EPD for relevant installations. Application for approval shall be submitted at least 28 days before the commencement of such work. The owners and operators are legally bound to submit such applications 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 emergency 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 Air Pollution Control Ordinance 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 of each emergency generator and the grade of the fuel to be used complies with the requirements of the Air Pollution Control (Fuel Restriction) Regulations, i.e. sulphur content of the fuel does not exceed 0.005% by weight and the viscosity does not exceed 6 centistokes at 40 degree Celsius;
 - (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 statements that the outlets of the flues/chimneys are at least 5 m from the surrounding sensitive receptors such as openable doors / windows, as well as any fresh air intake point of the HVAC system, and not under any canopy or balcony (the 5m rule here is only a general requirement rather than a rule of thumb or a fixed standard, please refer to Section 4.1 for the guiding principles and further details);
 - (f) direct the exit of the flue(s) / chimney(s) vertically upward without rain caps;
 - (g) if the chimney is located on an unoccupied podium/roof, it should be at a minimum distance of 3m above the parapet wall of the podium or the highest point of any structure on the podium/roof. For an occupied podium, the 3m should be measured from the top of the occupied structure or the highest point of any structure on the podium/roof. In case the ventilation is good and the emission is unlikely to cause any air pollution, the exhaust outlet may be allowed at lower level but a minimum distance of 5m above ground should be complied with;
 - (h) provide the name and the address of owner(s) of the emergency generator(s);
 - (i) provide the detailed particulars of the generator(s) such as its/their catalogue(s)/specifications and indicate in the submitted plan the brand name, model, fuel consumption rate and capacity of the generator(s);
 - (j) all plans shall be signed (except the block plan) by a qualified engineer who is a registered professional engineer in the building services, gas, chemical, marine mechanical or environmental 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; and chimney structural details and block plans are to be prepared by an authorized person;
 - (k) submit two (2) sets of plans; and
 - (l) 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. Under 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 the 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 a norm 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 regard 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 light wells, etc.

To avoid unnecessary delay, the applicants should properly locate the chimneys to avoid air pollution and submit their applications 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 the originally proposed plan is 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 sensitive receptors, say, exhaust outlets immediately above the podium levels of residential developments, in the proximity of nearby inhabitants or at such a place where the ventilation is not good, the application will only be approved upon satisfactory demonstration by the applicant on the provision of effective air pollution control measures to alleviate the impacts to ensure that the emissions of the emergency generator will not cause any air pollution to the nearby sensitive receptors. Such additional mitigation measures may include:

- * **Low emitting emergency generator** – in consideration of the loading demand, select emergency generator with low emission of particulate matter (i.e. ≤ 0.1 g/kWh or 0.075 g/bhp-hr); and / or
- * **Catalytic converter** – typically a stainless steel box mounted in the exhaust system fitted with an auto-catalyst (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); and / or
- * **Diesel particulate trap filter (soot trap)** – consists of a filter material positioned in the exhaust designed to collect at least 80% of the solid and liquid particulate matter emissions.

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

Environmental Compliance Division
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