




## SOP

### Failure of Diesel Engines Plant Emissions Abatement Equipment

#### Revision List


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## 1. Aim and Scope


The objective of this procedure is to establish the actions to be taken in case of failure of the emission abatement equipment of the diesel engine plant installed at Delimara Power Station. This document is a direct requirement of Clause 1.5.1/13 of the IPPC permit IP 0002/7/C

## 2. References

EN ISO 14001:04 Clause 4.4.6

## 3. Terms and Definitions

Bag Filters	These are fine mesh filters made from specialised textiles. Flue gas is made to pass through this material. In doing so, the particulates in the flue gas are deposited on the surface of the material. This material is then purged from the surface of the bag filters and falls to the bottom of the housing from where it is transferred to the waste silo.
Effluent Treatment Plant	The boiler wash and effluent system is designed for washing the exhaust gas boilers and to treat the exhaust gas boiler wash water from the exhaust gas boilers.
FGD system	This consists of the Flue Gas Desulphurisation Equipment which also includes the reagent unloading system, silos, reagent mills and injection equipment into the FGD. This equipment to reduce sulphur oxides emissions from the flue gas. Equipment operates by the injection of fine particles of Sodium Bicarbonate in the flue gas. The Sodium Bicarbonate

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then reacts with the sulphur oxides to produce Sodium Sulphate and Carbon Dioxide.

**FGD byproduct Silo system** This consists of the FGD byproduct silo, the particulate transport system from the respective bag filter system to the silo as well as the silo unloading system. The particulates from each of the four bagfilter housing are collected and temporarily stored into this silo. These particulates are then transferred into appropriate sealed containers for export.

**MEPA** Malta Environment and Planning Authority


**Oily Water Treatment Plant** The oily water and sludge collection system at DPS diesel engine plant, collects all the oily water and sludge from this plant for final treatment in the oily water filtering unit, before disposing of it out into the oily water interceptor.

**NOx abatement plant** This consists of the SCR, Selective Catalytic Reducer – Equipment in order to reduce NOx emissions from the flue gas as well as all the ancillary plant including the Urea unloading, mixing and injection equipment. Equipment operates by the injection of a 40% urea solution in the flue gas. The urea reacts with the NOx in the flue gas to produce Nitrogen and Water. This reaction takes place in the presence of a catalyst

**SM** Station Manager

**SOE** Shift Operations Engineer

**ME** Maintenance Engineer

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RAO Regulatory Affairs Office


EMS Environmental Management System

#### 4. Responsibilities

Manager Projects	Oversees the installation and commissioning of the diesel engine plant.
Station Manager DPS	Carries out the overall management of the operation and maintenance of all plant installed at Delimara Power Station
Shift Operations Engineer	Responsible for the operations of the plant under his/her responsibility. Amongst other duties, these include the monitoring of the emission abatement equipment installed in the diesel engine plant
Maintenance Engineer	In charge of the maintenance of the equipment installed at Delimara Power Station including the emission abatement equipment installed in the diesel engine plant
RAO	Coordinates the reporting between Enemalta Corporation and MEPA

#### 5. Operative Rules

The Station Manager or his assigned deputy together with the help of their staff shall ensure that the emissions from the emission abatement equipment installed on the new plant shall comply with the limits as stated in the IPPC permit IP 0002/7/C. Should these emissions exceed these stipulated limits, the following course of action shall be undertaken.

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### **5.1 Exceedance of the emissions of NOx**

The SOE shall report any abnormal exceedance of NOx emissions from the stacks to the SM or his deputy and if need be to the MEs. Action shall be taken to determine the cause and eventual corrective action to be taken. The time expected to clear these events should be determined.

If such events arise from operational issues, then action is immediately taken to remedy the situation. Should other causes be the source of such an event, the MEs are notified. They shall commence fault finding procedures to establish the cause. Should the cause and the remedy be implemented within a time span of less than 24 hours the affected equipment shall remain in operation. However, any procedure that shall result in the emissions of NOx in excess of this time, action shall be taken as follows:


- Start the available alternative plant and shut down the affected diesel engine plant. Repairs shall then continue until the fault is cleared.
- If no spare plant is available and shutting down the affected diesel engine generating equipment would result in the interruption of electricity, the Director of Environment or his/her delegate at MEPA shall be informed via email on email address [ippc@mepa.org.mt](mailto:ippc@mepa.org.mt) of this event and await instructions accordingly. In this case, any remedial action being carried out to reduce the emissions of NOx shall continue until fault is cleared.

It is to be stated that the emissions of NOx are virtually independent of the fuel adopted. Therefore, the changing of fuel from HFO to gasoil does not affect this situation.

### **5.2 Exceedance of Emissions of Sulphur Oxides**

The SOE shall report any abnormal exceedances of Sulphur oxides emissions from the stacks to the SM or his deputy and if need be to the MEs. Action shall be taken to determine the cause and eventual corrective action to be taken. The time expected to clear these events should be determined.

If such events arise from operational issues, then action is immediately taken to remedy the situation. Should other causes be the source of such an event, the MEs

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are notified. They shall commence fault finding procedures to establish the cause. Should the cause and the remedy be implemented within a time span of less than 24 hours the affected equipment shall remain in operation. However, any procedure that shall result in the emissions of Sulphur oxides in excess of this time, action shall be taken as follows:

Switch the affected diesel engine/s to gasoil firing to reduce the emissions to IPPC specified levels. Such a procedure shall continue until the fault in the FGD system is cleared. In this case, operational requirements shall determine whether the affected engine/ s shall operate in combined cycle or in open cycle mode.


Should the operational situation be such that the above solution would not be possible, then action shall be taken as follows:

- Start the available alternative plant and shut down the affected diesel engine plant. Repairs shall then continue until the fault is cleared.
- If no spare plant is available and shutting down the affected diesel engine generating equipment would result in the interruption of electricity, the Director of Environment or his/her delegate at MEPA shall be informed of this event via email on email address [ippc@mepa.org.mt](mailto:ippc@mepa.org.mt) and await instructions accordingly. In this case, any remedial action being carried out to reduce the emissions of Sulphur Oxides shall continue until fault is cleared.

### **5.3 Exceedance of Emissions of Particulates**

The SOE shall report any abnormal exceedances in particulate emissions from the stacks to the SM or his deputy and if need be to the MEs. Action shall be taken to determine the cause and eventual corrective action to be taken. The time expected to clear these events should be determined.

Should other causes be the source of such an event, the MEs are notified. They shall commence fault finding procedures to establish the cause. Should the cause and the remedy be implemented within a short time span of less than 24 hours the affected

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equipment shall remain in operation. However, any procedure that shall result in the emissions of particulates in excess of this time, action shall be taken as follows:

Switch the affected diesel engine/s to gasoil firing. Such a procedure shall continue until the fault in the FGD/Bagfilters system is cleared. In this case, the affected engine/ s shall operate in open cycle mode.

Should the operational situation be such that the above solution would not be possible, then action shall be taken as follows:

- Shut down the affected diesel engine plant and make use of standby generation capacity. Repairs shall then continue until the fault is cleared.
- If no standby plant is available and shutting down the affected diesel plant generating equipment would result in the interruption of electricity, the Director of Environment or his/her delegate at MEPA shall be informed via email on email address [ippc@mepa.org.mt](mailto:ippc@mepa.org.mt) of this event and await instructions accordingly. In this case, any remedial action being carried out to reduce the emissions of particulates shall continue until the fault is cleared.


#### **5.4 FGD Silo System Fault**

It is to be stated that a fault in the FGD silo system shall not directly result in the exceedance of any emissions. However, the loss of operation of this system for a period of time depending on which equipment the fault occurs, shall result in the shutting down of the FGD and / or Bag filter system/s. Therefore, the procedure that shall be followed shall be the same as the occurrence of faults arising from the exceedance of emissions of particulates or Sulphur oxides.

#### **5.5 Effluent treatment Plant**

Should the boiler effluent, two mobile sediment water evaporated basins not be in operation (to evaporate the water from the solid part), then the boiler wash water is drained into a sealed tank container for disposal by a permitted waste contractor. This will be disposed of as hazardous waste using the appropriate European Waste Catalogue (EWC) Code.



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### **5.6 Oily Water Treatment Plant**

Should the oily water separator be out of order, the oily water and sludge is pumped to the sludge tanks.

The oily water mixture will then be disposed of as hazardous waste using the appropriate European Waste Catalogue (EWC) code.

### **5.7 Abatement Equipment Failure Record**

It is the responsibility of the SM or his delegate to maintain records of the failures/faults that have taken place. Such records should be made readily available for inspection and review by internal and external auditors. It is also important that RAO is informed immediately, since this may constitute a non conformity in the context of the EMS.

### **5.8 Abatement Equipment Failure Reporting**

In line with the obligations of the IPPC permit, and the EMS, the Director of Environment Protection of MEPA, or his delegate, shall be notified by email through RAO about any malfunction or breakdown of the abatement equipment within 24 hours. It may be necessary to use Schedule 1 template of the IPPC permit.

## **6. Reference Documents**

Delimara Power Station IPPC permit IP 0002/07/C and amendments