

C1.2 Non-technical Description of New Plant.

The proposed power electrical generating plant consists of eight Wartsila 18V46 medium speed diesel engines capable of burning Heavy Fuel Oil (HFO) and gasoil, and a steam turbine which is operated by steam generated by boilers which recover heat from the exhaust of the diesel engines. The diesel engines shall be supplied by Wartsila. The proposed plant is 46.8% efficient at full load. The power plant incorporates 8 Selective Catalytic Reduction (SCR) units for NO_x reduction, and 4 De-SO_x units for SO_x reduction, and filter bag units for particulate reduction. Finally exhaust gases are exhausted to atmosphere through 2 stacks.

Fresh water required for this plant will be produced by two evaporators operating off the waste heat of this plant.

Main equipment

An SCR unit is fitted after each diesel engine. The SCR system consists of:

1. Injection and mixer system including all necessary auxiliary equipment.
2. SCR reactor with the catalysts elements

The auxiliary equipment to the injection system includes a receiving trough (containers carrying the urea unload into this trough), a water buffer tank system, two heated mixer tanks to dissolve solid urea in water, and a 3-day storage tank for the urea solution.

After the SCR unit, a waste heat recovery boiler will be installed after each diesel engine. Steam is generated in these exhaust heat recovery boilers with economizer, evaporator section, and super heater section. This steam is utilised for fuel oil heating, for internal plant requirements, and to drive a 13 MW Steam Turbine to increase the efficiency and power output of the plant. The exhaust stream from two boilers is then routed to a common DeSO_x unit.

The De-SO_x and particulate reduction consists of:

1. A reactor for injection of dry sodium bicarbonate powder where the contact between SO_x and reactant will occur.
2. A bag filter, where ash, particulates and DeSO_x unit by-product will be removed from the exhaust gas. The final reaction and absorption of SO_x will occur on the filter bag surface.
3. 3 De-SO_x sorbent storage and transport auxiliary equipment.

The diesel engines and ancillary plant shall be housed in an engine room structure complete with sound proofing, weather protection, overhead crane/s and space for unloading and maintenance. The waste heat boilers and the post combustion emission control plant shall be sited outdoors.

The shed that will house the plant will be similar to the ones already existing on site with a height of 18m. The diesel engines shall incorporate fresh water heat exchangers. This fresh water is then cooled by sea water. The final heat sink is to be sea water.

Two 65m high stacks will be located towards the eastern boundary of the station.

Auxiliary Equipment

Apart from the above main plant located on the selected plot of land, other equipment will be required for the safe and reliable operation of the plant. This is to be constructed on other areas within the Delimara Power Station (DPS) complex. The selected plot of land has an area of around 3,325m². This area is sufficient to accommodate the following ancillary plant:

Service tank Farm

Fuel Treatment Facility including:

Gasoil day storage tank; 140m³ (A gasoil storage tank is required for operation of the diesel engines on gasoil when required.)

HFO service tank; 2 x 125m³

HFO buffer tanks; 2 x 125m³

Sludge storage tank; 40m³

Centrifuge Building

Lube oil Storage Tank; 175m³

Lube oil drain tank: 25m³

Oily water treatment facility

Urea Plant

Urea mixing equipment

Urea solution buffer tank; 2 x 125m³

Urea container storage area

Flue Gas Desulphurisation (FGD) Reagent and Waste handling Plant

Container Storage: for Reagent and waste

FGD Powder Transport Station

FGD Waste Silo

Definitions of Acronyms in diagram: C1.2 DPS P3 02 GPD

EGB: Exhaust Gas Boiler (Waste Heat Recovery Boiler);

FWG: Fresh Water Generator;

DE: Diesel Engine;

ST: Steam Turbine,

SBC: Sodium BiCarbonate.