



## Marsa Power Station

Decommissioning, Dismantling & Demolition

Project Description Statement

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## 1. Introduction

The Marsa Power Station (MPS) is located at the inner end of the Grand Harbour, as per Fig. 1. The site is located on two levels, the lower level has an elevation of approximately 2m above sea level, and the upper level, also known, as Jesuit hill has an elevation of between 26 and 37m above sea level.

### 1.1 Historical Development

MPS started as an underground station. In fact a report by the then Governor of Malta General Sir Charles Bonham Carter, dated October 1936, recommended the construction of a power station (later known as the underground station or 'A' station) be constructed at church wharf Marsa, which was at the time, used as the site of the Admiralty Coal Stores. The station was to be installed underground to offer "a high degree of protection from hostile attack".

At the time of writing this report, a level space had already been formed by removal of rock from the south of Jesuit Hill Marsa to a distance of approximately 60 m inland. The report recommended that this level space in front of Jesuit Hill be utilized for offices, workshops, coal yard etc.

The new underground Power station was installed in the galleries excavated in the base of Jesuit Hill and was inaugurated in December 1953, initially with a capacity of 15 MW.

Due to increase in electricity demand the station was expanded further to a final capacity of 30MW.

This power station ('A' station) consisted of 5 steam turbines rated at 5MW each, situated inside the Turbine gallery. The Boiler Gallery housed 4 HFO fired boilers producing steam to drive the steam turbines. 4 HFO storage tanks cut in the rock and cement lined also formed part of the 'A' station complex. The last extension consisted of the commissioning of a Diesel fired Gas turbine rated at 5MW, which was housed in a separate underground gallery.

The station was totally closed down in September 1994.

Due to the lack of expansion space inside the galleries of 'A' station it was decided that a new power station would be erected next to it, on the south side of Jesuit Hill in the previously leveled area. The new power station, also known as 'B' station, was inaugurated in 1966 when the first two units were commissioned.

The B station complex comprises operational plant in the centre of the site, a workshop, an administration and other ancillary buildings .

Bulk fuel storage tanks are located on a higher level on top of Jesuits Hill on the northern part of the site. The tunnels of the underground station remain under Jesuits hill, the majority of which are now empty.



Fig 1:- MPS situated at end of Grand Harbour, Marsa.

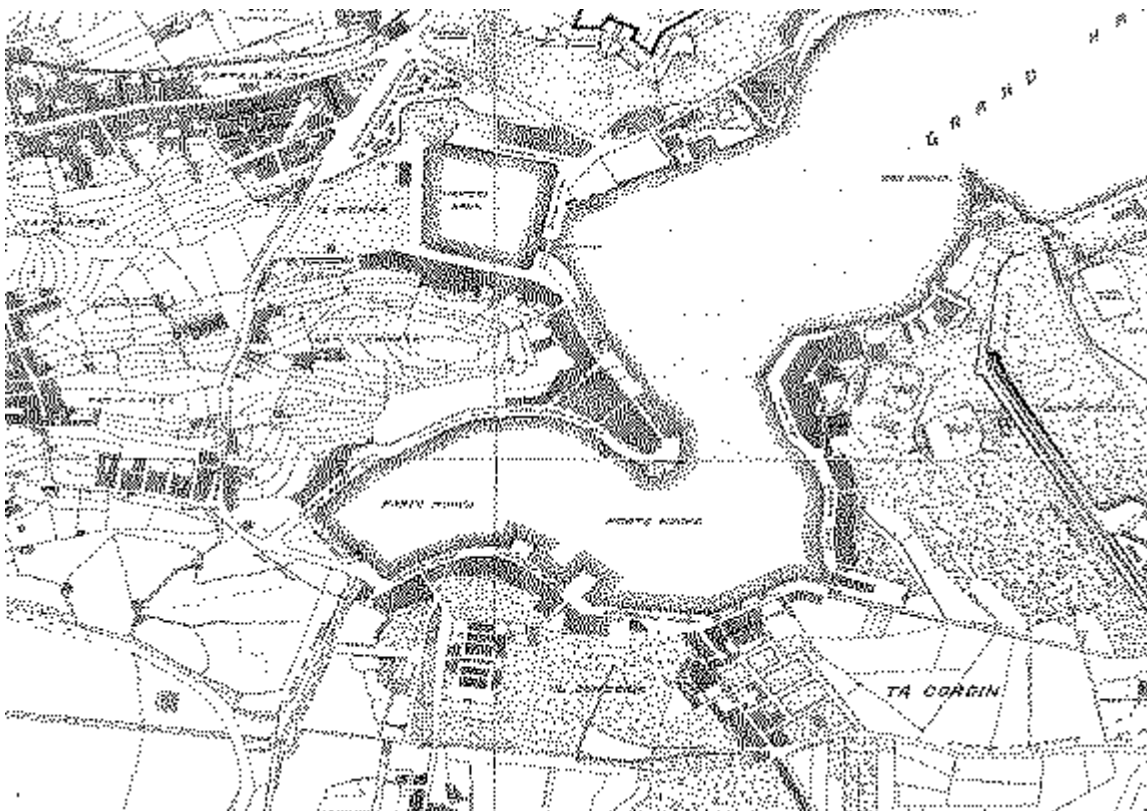


Fig 2:- MPS site late 1940s





Fig 3:- 'A' Station Underground galleries

## 2. Project Description

This project is for the decommissioning, dismantling and demolition of all equipment and civil structures (except for the current Administration Block) currently occupying the site of Marsa Power Station as can be seen in the Drg. No. 4 below.



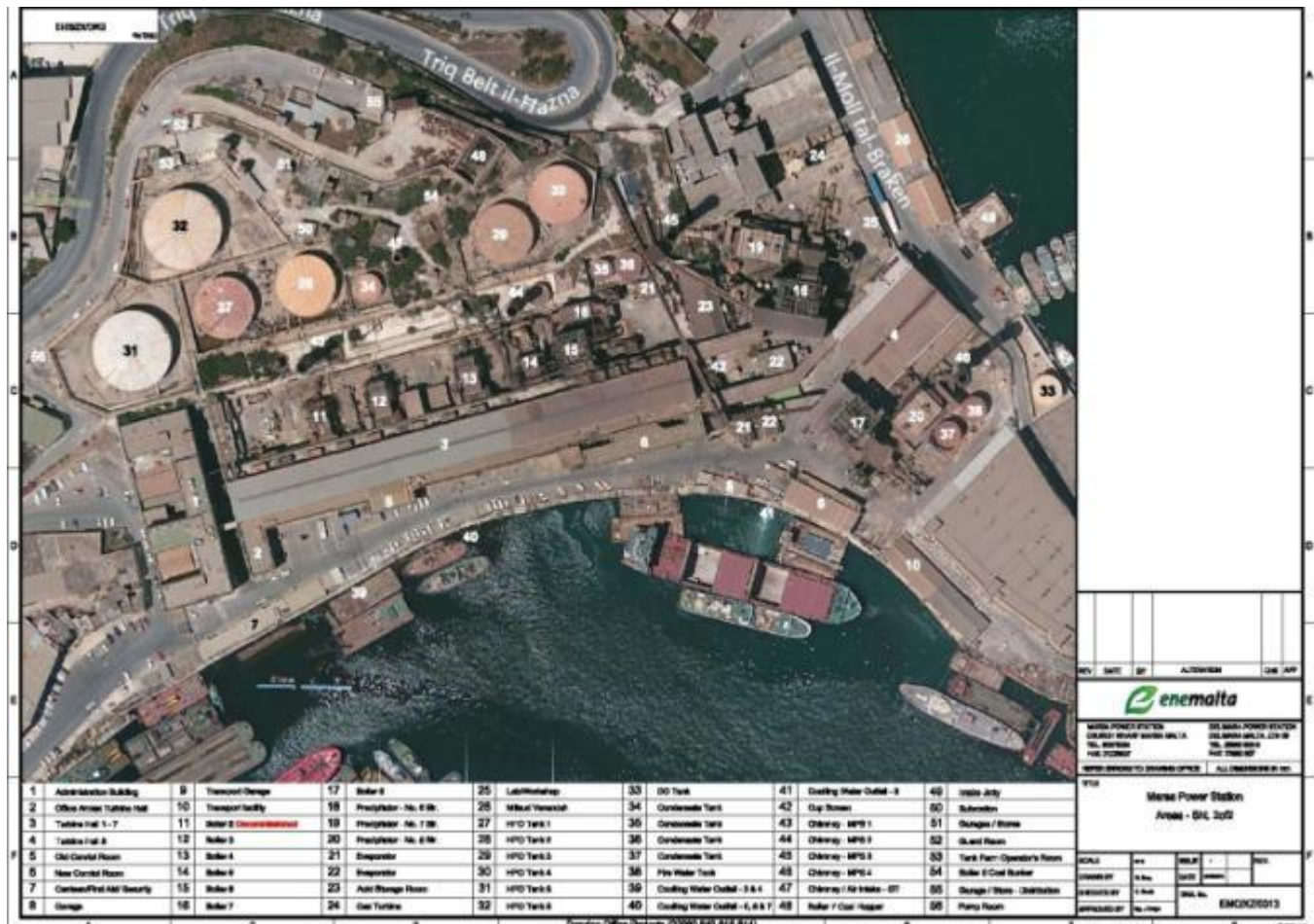


Fig 5:- MPS Arial view with labeled structures

### 3. Structures on site

The present MPS ('B' station) was constructed in several phases between early 1960 and 1990s and had a maximum installed generating capacity of 267MW.

The site of MPS has been divided into zones as presented in the Full decommissioning plan. The major infrastructural equipment currently present in this station on a zone by zone basis is given in the Table below:-



Zone	Name of Zone	Main Structures/Equipment present in zone	Intended Status
1	<b>Administration Bld.</b>	Administration Building – Offices, distribution workshop & stores.	To be retained
2	<b>Gatehouse/Canteen</b>	Security gate house, attendance room, canteen and stores	To retain security guard room. The other structures are to be demolished
3	<b>Turbine Hall West</b>	Turbines 1 – 4, Boilers 2 – 4, old control room & office annex building	To be demolished
4	<b>Turbine Hall East</b>	Turbines 5 – 7 & Boilers 5 & 6, water production facilities, new control room. Garage facility	To be demolished
5	<b>Unit 8</b>	Turbine 8 & Boiler 8 including Gas oil storage tank and auxiliaries. Main transport Garage for maintenance of cars. Sea water intake jetty	To be demolished. However sea water intake Jetty to be retained
6	<b>Boiler 7</b>	Boiler 7, laboratory building including stores/workshop	To be demolished
7	<b>Gas Turbine</b>	Gas turbine	To be removed
8	<b>Small Tank Farm</b>	Heavy Fuel Oil Storage Tanks Nos. 3 & 4	To be demolished
9	<b>Large Tank Farm</b>	Heavy Fuel Oil Storage Tanks Nos. 1, 2, 5 & 6	To be demolished
10	<b>A station Hill top</b>	Boiler 7 and Boiler 8 Coal Bunker, Blr 6 coal structures, Stores, Gate-house, Substation, Operators rest room, A station Gas turbine chimney and filter house	To be demolished.

Table 1:- Labeling of Zones



Fig 6: – MPS Arial view divided into zones.

### 3.1 Zone 2 – Gate House

This is one Storey stone structure consisting of various rooms laid out in line (series), which serve as a security guard post, employee attendance recording area, canteen, clinic and miscellaneous stores. The total floor area of the structures in this zone is approx 607m<sup>2</sup>. The security guard house will be retained whilst the rest of the structures will be demolished.



Fig 7:- Canteen/Gate house/clinic complex

### 3.2 Zone 3 – Turbine Hall West

This area comprises the generating units erected during the first development period of Marsa Power Station, also known as “B” Station. This development phase took place between 1966 and 1970 and consisted of steam generating units, electricity producing Generators and also Sea Water Distillers, which are no longer on site. The area is divided into two main areas.

- a) A turbine Hall approx 125m by 27m wide housing the steam turbines. The Turbine Hall is constructed from Stone, Steel Galbestos side sheeting and Pre cast concrete roof supported on steel beams. Inside the Turbine hall are the reinforced concrete structures acting as support and foundations of the steam turbines. Also forming part of this turbine Hall area is an office building annex and the old control room.
- b) An open area on the North side of the Turbine hall housing the Boiler and Distillers equipment. This area is sandwiched between the Turbine Hall and the cliff Face of Jesuit Hill, housing the underground station galleries. The Boilers present in this area are boilers 2 & 4 and consist of an open steel structure. Chimney MPS 1, dedicated to the operation of Boilers 3 and 4 is also present in this zone.

Unit	Manufacturer	Commissioned	Remarks	Status
1 x 90 ton/hr Steam Raising Boilers	Thompson	1966	HFO fired Boiler	Boiler scrapped. Boiler 1 was physically removed from site several years ago whilst Boiler 2 is still site.
2 x 120 Ton/hr Steam Raising Boilers	Franco Tosi	1970	HFO fired Boiler	These are Boilers 3 and 4. Both Boilers are awaiting formal decommissioning
2 x 10MW Steam Turbines and Generators	Franco Tosi	1966		Turbine 1 Not available and awaiting formal decommissioning, Turbine 2 on cold preservation
2 x 30MW Turbine and Generator	Franco Tosi	1970		Turbines 3 & 4 on cold preservation

Table 2:- Major electricity Generating Equipment in Zone 3





Fig 8:- Boilers 2, 3 and 4 in space between Turbine hall and cliff face



Fig 9:- Turbine Hall – West End – Turbine 1 in foreground

### 3.3 Zone 4 – Turbine Hall East

Zone 4 consist mostly equipment installed in the second phase of expansion of Marsa Power Station “B” Station between 1982 and 1985. Basically zone 4 is an extension of zone 3 keeping with the same basic layout as found in zone 3. This zone is again mostly divided into two main areas.

- a) The turbine hall is an extension of the Turbine Hall found in Zone 3 and houses the auxiliaries and structures connected with Turbines 5 to 7. The turbine hall length in zone 4 is approx. 54 m long by 18 m long and is a continuation of the Turbine Hall of Zone 3.
- b) The open space in the North of the turbine Hall houses two Boilers Basically Boiler 5 and Boiler 6 together with their auxiliary equipment and chimney MPS2.
- c) However also included in this zone are various other facilities such as Sea Water Evaporators, Demineralization plants, Acid Storage facilities, new control room, sea water screen house filtration system and independent garage.

Unit	Manufacturer	Commissioned	Remarks	Status
1 x 130 Ton/hr Steam Raising Boiler	Mitsui	1982	Fired by HFO	Cold Preservation
1 x 130 Ton/hr Steam Raising Boiler	Mitsui	1984	Original coal fired converted to HFO	Cold Preservation
1 x 30MW Turbine and Generator	General Electric	1952 (Palermo Italy)	Installed and commissioned at MPS in 1982	Operational
1 x 30MW turbine and Generator	General electric	1952 ( Palermo Italy)	Installed and commissioned at MPS in 1983	Operational
1 x 30 MW Turbine and Generator	Ansaldo	1952 (Palermo Italy)	Installed and commissioned at MPS in 1984	Operational

Table 3:- Major electricity generating equipment in Zone 4



Fig 10:- Turbine Hall – East Side Turbine 7 in the foreground





Fig 11:- Boiler 6 and Boiler 5 in the space between Turbine Hall and cliff face

### 3.3.1 Water Production Facilities in Zone 4

Unit	Manufacturer	Capacity	Commissioned	Status
2 x flash Evaporators	Sidem	31 m <sup>3</sup> /hr each	1993	Operational
Old DM Plant 1 Train1	Portals Water Treatment	19 m <sup>3</sup> /hr		Operational
Old DM plant 1 Train 2	Portals Water Treatment	19 m <sup>3</sup> /hr		Operational
New DM plant 2 Train 1	Termo chimica	45 m <sup>3</sup> /hr	1984	Operational
New DM plant 2 Train 2	Termo chimica	45 m <sup>3</sup> /hr	1984	Operational

Table 4:- Water production equipment in zone 4





Fig 12:- Sea Water Evaporators

### 3.3.2 Storage Facilities – Condensate

Unit	Used For	Zone	Height m	Diameter m	Status
Tank 5	DM Water	4	6.3	9.2	In service
Tank 6	DM Water	4	8.6	9.2	In service
Tank 7	DM Water	4	8.3	11.5	In service
Tank 8	DM Water	5	8.5	11.5	In service

Table 5:- Water storage facilities



Fig 13:- Old Demin plant and water storage Tanks 2 and 3

### 3.3.3 Storage Facilities - Acid

Tank No	Chemical	Capacity	Constructed	Status
1	98% Sulphuric Acid	250 T	1969	Waiting Decommissioning
2	98% Sulphuric Acid	250 T	1969	Waiting Decommissioning
3	98% Sulphuric Acid	250 T	1969	Waiting Decommissioning
4	98% Sulphuric Acid	250 T	1969	Waiting Decommissioning

Table 6:- Acid Storage Equipment



Fig 14:- Acid storage Facility

#### 3.4. Zone 5 – Unit 8 Area

This Zone consists mainly of Unit 8 generating unit. This is a self contained generating unit with its steam cycle not connected to the other units at MPS as is the case for steam units 1 to 7 which are all connected to a common steam header.

- a. The turbine hall covers an area of approx 40 m x 35 m. Inside this turbine hall is the Steam Unit 8 which is the biggest steam turbine at MPS with a capacity of 60MW together with various auxiliaries for the proper operation of the steam turbine.
- b. The Steam turbine is powered by steam generated by Boiler 8 which fires HFO. Boiler 8 like Boiler 7 used to be operated on coal but both boilers were converted to fire only HFO in the early 90s. However the structures connected with coal firing are still present.
- c. Other major equipment found in Zone 5 of the Power station include:



- i. Transport Division Maintenance garage,
- ii. Condensate storage Tanks
- iii. Chimney MPS 4
- iv. And Gasoil storage Tank used by the Gas turbine
- v. Sea water intake jetty

Unit	Manufacturer	Commissioned	Commissioned Malta	Status
1 x 300Ton/hr Steam Raising Boiler	Foster Wheeler	1987		Operational
1 x 60MW Turbine and Generator	Parsons	1954 (Little Bradford UK)	1987	Operational

Table 7:- electricity generating equipment zone 5



Fig 15:- Boiler 8





Fig 16:- Turbine No.8



Fig 17:- Main Transport garage



Fig 18:- Sea Water intake Jetty

### 3.5 Zone 6 - Boiler 7

The major equipment in this area is Boiler 7 which is physically linked through a common steam header to steam Turbines 2 to 7. Boiler 7 like Boiler 8 started off as a coal fired boiler but this boiler was also converted to fully HFO firing in the early 90's. However structures connected with coal firing such as conveyor systems are still present on site. Chimney MPS 3 connected to Boiler 7 is also present in this zone. Also present in the area is the MPS laboratory building.

Unit	Manufacturer	Commissioned	Type	Status
1 x 300Tons/hr Steam Raising Boiler	Foster Wheeler	1985	Original Coal fired converted to HFO	Operational

Table 8:- Main equipment in zone 6



Fig 19:- Boiler 7



Fig 20:- Laboratory Building

### 3.6 Zone 7 – Open Cycle Gas Turbine

The Open cycle Gas turbine is situated in Zone 7 and consists of a GE Frame 6B Gas Turbine fired by Gas oil fuel having a black start capability.

It is intended that the Gas turbine will be removed from its present position.

Unit	Manufacturer	Commissioned	Fuel	Status
1 x 37 MW Open cycle Gas turbine & generator	Alsthom	1990	0.1% Gas Oil	Operational. Used for emergency and is black start capable

Table 9:- Generating equipment in Zone 7





Fig 21:- Open cycle Gas Turbine

### 3.7 Zone 8 & 9 – HFO Tank Farms

Zones 8 and 9 are taken together as these two Zones consist of HFO storage tanks used for the storage of fuel to power the boilers of Marsa Power Station.

Unit No	Type	Diameter	Height	Approximate Capacity MTons	Bund	Zone	Status
1	HFO	24	9	4140	Shared Bund	9	In service
2	HFO	24	9	4140		9	cleaned
3	HFO	24	9	4140	Shared Bund	8	In service
4	HFO	24	9	4140		8	In service
5	HFO	33	11.5	9600	Single	9	In service
6	HFO	33	11.5	9600	Single	9	In service
9	Gas Oil	12.5	12	1240	Single	5	In service

Table 10:- Fuel Storage Tanks



Fig 22:- Fuel Storage Tank Farm on top of Jesuit Hill



Fig 23:- Gas oil storage tank in Zone 5

### 3.8 Zone 10 - “A station” Hill Top

The hill top of A station has a substantial number of stone structures which are either connected with the use of A station Galleries, in order to provide ventilation to the Galleries below ground and hence cannot be demolished, or else connected with the use of coal as a main source of fuel for Boilers 6, 7 and 8, which include coal hopper system and coal conveying systems. The main structures are given in the table below

Item No	Description					Construction Materials
1	A station GT chimney and Intake Filter House					Stone, concrete
2	Blr 7 & Blr 8 coal bunker					Stone, steel , & rubble
3	Tank Farm Operators rest room					Stone, concrete
4	Guard House					Stone, concrete
5	Stores/Garages of Distribution Section					Stone, concrete
6	Coal conveyors Steel Structures					Steel

Table 11:- Main structures on top of Jesuit Hill



Fig 24:- A station gas turbine chimney and filter house





Fig 25:- Boiler 7 & Boiler 8 Coal Bunker facility



Fig 26:- underground station vents



Fig 27:- Tank farm operator's rest room



Fig 28:- Distribution section garages

### 3.9 Chimneys

Unit	Type	Height	Average Diameter	Associated Equipment	Zone
Chimney MPS 1	Reinforced concrete	52 m	3.8 m	Boiler 3 & 4	3
Chimney MPS 2	Reinforced concrete	52 m	3.8 m	Boilers 5 & 6	4
Chimney MPS 3	Steel	75 m	4.2 m	Boiler 7	5
Chimney MPS 4	Reinforced concrete	75 m	4.2 m	Boiler 8	6
Chimney A station	Reinforced concrete	12 m	3.5 m	Gas turbine A station	10

Table 12:- Chimneys present at Marsa Power Station



Fig 29:- chimneys at MPS

### 3.10 Major Infrastructures and Material used

Item	Description	Cross identification to Annex 1	Zone	Construction Materials
1	B Station Turbine Hall West	3	3	Stone, Concrete, Steel beams, Steel sheeting
2	B Station Turbine Hall East	3	4	Stone, Concrete, Steel beams, Steel sheeting
3	Unit 8 Turbine Hall	4	5	Stone, concrete Steel beams Steel sheeting
4	Security/canteen/clinic	7	2	Stone, concrete roof
5	Transport Garage	9	5	Stone, concrete roof
6	Control room	5 & 6	4	Stone, concrete
7	Acid Plant shed	23	4	Stone, asbestos cement roof
8	Office Block Annex of Turbine Hall	2	3	Stone, concrete roof
9	DM Plants (old and new)	21 & 22	4	Stone, concrete roof
10	Miscellaneous Garage	8	4	Stone, concrete roof
11	Laboratory/Stores/Workshop	25	6	Stone, concrete roof
12	Boilers 2,3 and 4	11, 12 & 13	3	Open steel structure
13	Boilers 5 & 6	14 & 15	4	Open steel structure
14	Boiler 7	16	6	Open steel structure
15	Boiler 8	17	5	Open steel structure
16	Sea Intake filtration station	42	4	Steel structure, concrete
17	Sea Water Intake Jetty	49	5	Reinforced concrete
18	A station GT chimney and Intake Filter House	47	10	Stone, concrete
19	Blr 7 coal Bunker on top of Jesuit Hill	48	10	Stone, steel , & rubble
20	Miscellaneous structures on top of A station	51 to 55	10	Stone

Table 13:- Major infrastructure at MPS





Fig 30:- Turbine Hall and Old control room



Fig 31:- Panoramic of MPS



Fig 32:- Mifsud Verandah Stores



Fig 33:- Sea Water cup screens filtration system

#### 4 Current generation status & project justification

MPS site is used for the generation of Electricity together with associated activities such as generation of makeup water and storage of fuel. The site operations are regulated by IPPC permit No IP0003/07A issued on 29 March 2010.

The current maximum Electricity seasonal demands on the national grid are approx:

Winter Season: 380 MW

Summer Season 420 MW

Spring/Autumn Season 280 MW

MPS has a max current available capacity of approx 190 MW, which includes an open cycle black start Gas Turbine. At the end of 2012 a new diesel engine generating plant was commissioned at Delimara Power Station with an installed capacity of 144MW. This new generating plant has brought the maximum installed generating capacity at Delimara Power Station up to approx 434MW.

Since the introduction of the Diesel engine plant at DPS the actual maximum output at any one time from MPS has been limited to around 60MW, as normally only Boiler 8 is kept in service. When Boiler 8 is shut down, this is replaced by Boiler 7 together with Turbines 6 and 7. Total output from MPS may rise to a max production of approx. 120MW (Boiler 7 and Boiler 8 in service simultaneously) during the peak summer months. The rest of the generating plants at MPS, are kept in a state of cold preservation.

##### 4.1 Interconnector Project.

Another project which is currently at an advance stage of completion is the interconnecting power line to the European mainland via Sicily. It is anticipated that the project will be commissioned in the first Quarter of 2015. Once this project is commissioned, Enemalta will be able to purchase up to 200MW of electricity from the European market. This development will allow Enemalta to shut down completely MPS and no electricity will be produced from MPS.

However in order to ensure security of supply to the Maltese Islands it is planned that Units 5 to 9 at MPS will be kept in a state of cold Preservation till the new Gas Fired Power plant is commissioned at DPS. The new Gas fired Power plant is planned to have a capacity in excess of 200MW and is scheduled to be completed by 2016. Once the new Gas fired Power Plant is commissioned then the main electricity supply sources will be:-

- |  |        |
|--|--------|
| a. New Gas Fired Power plant           | +200MW |
| b. Diesel Engines Power plant          | 144MW  |
| c. Interconnecting cable               | 200 MW |
| d. Diesel Fired combined cycle plant   | 100MW  |
| e. Emergency Open cycle Diesel Engines | 105MW  |

Hence MPS can be decommissioned and dismantled without any adverse effect to security of supply.

## 5 Project Location and Surrounding Areas

As previously stated MPS is located in the inner Harbour and is situated close to dense population areas together with areas of commercial and industrial activities.

The immediate surrounding land uses to the MPS site are listed in the table below:-

Direction	Description	Name	Approx. Distance
To the north	Public road	N/A	Immediately north
	Mill	Marsa Flour Mills	Immediately north east
	Haulage	White Bros. Ltd	40m north west
To the south	Grand Harbour	N/A	Immediately south
	Customs Bonded stores	Customs	Immediately south east
To the east	Grand harbor	N/A	Immediately east
	Mostly Derelict Buildings	Various	Immediately south east
To the west	Mixed use of small business units, offices storage and residential	Various	Immediately west
	Petrol filling station	Enemalta Corp	Immediately west

Table 14:- Immediate neighbours of MPS





Fig 34:- Public road and Haulage Operator in the North



Fig 35:- Public road on East Side of Site



Fig 36:- Marsa flour Mill (North/East side)



Fig 37:- Customs Bonded Stores (south side)



Fig 38:- Buildings immediately north east



Fig 39:- small business units and residences (West Side)

## 6. Project Information

It is intended that the site of Marsa Power Station will be cleared of all equipment, Turbine halls, steel and civil structures, Fuel shore tanks, Acid tanks, bund walls, etc once it is no longer required. Only the Administration building will be left intact.

The project will be divided into three distinct phases:

- A. Decommissioning
- B. Dismantling/Demolition
- C. Site Remediation activities



## 6.1 Decommissioning:

Decommissioning is a generic term which basically means the preparation of plant, equipment and structures by taking them from an 'unknown state in terms of risk and hazards, to a 'known state ' ready for dismantling.

Decommissioning should be viewed as a three stage process.

The first stage is to minimize and /or the removal of bulk material like heavy fuel oils. This will be achieved by implementing existing routine shutdown, rundown and decontamination procedures, working to existing safe systems of work and hardware. Hence during this phase it is intended to consume the available stock of Fuel, chemicals, consumables and empty water Tanks during the final days of operation. Where ever possible equipment will be left in an empty state.

The second stage is to clean all systems to a pre-determined level using such procedures to include the in situ decontamination of pipework and equipment by such techniques, including flushing, purging and blow down where practicable. This phase may require minor modifications to equipment. As part of this phase there will also be both mechanical and electrical isolations and possible re routing of some services. All hazardous material and waste generated at this stage will be collected and disposed of as per applicable waste regulations.

The third stage of the decommissioning work includes work on identified plant items and systems that require further decommissioning and non routine procedures. This can include draining down of pipeline dead legs, pumping out into drums of hazardous material, as well as non-routine cleaning of plant, equipment and pipework, by application of solvents, neutralizing solutions etc. This stage will also allow for intrusive inspections, to determine the internal condition of process equipment after all cleaning has been carried out. Dependent on residual product properties, all equipment should be left open for venting. Some of the major work which will be carried out during this phase will include:

- a. The emptying of lubricating oil from the steam turbines
- b. The emptying of Hydraulic oils from control systems
- c. The emptying of oils from transformers
- d. The emptying of lubricating oils from pumps and miscellaneous equipment
- e. Emptying of kerosene, antifoam, antiscald, oxygen scavengers, pentomag, chlorine dioxide, acids, caustic soda, fly ash, bottom ash, coal, very viscous lubricating oil found under ball mills etc. from their respective systems.
- f. Removal of HFO from equipment found in each of the boilers' Heating and pumping units
- g. Draining of Dead legs
- h. Intrusive inspections to check internal condition of equipment
- i. Further mechanical and electrical isolations

All wastes generated during this section of the Decommissioning activities will be collected, segregated and disposed of, as per applicable waste disposal regulations.

It is envisaged that preparation for decommissioning works will be undertaken using existing Enemalta procedures and personnel.

## 6.2 Dismantling/Demolition

The normal objective in this phase is to first try to identify if any equipment can be re-used, as the benefits to this are potentially increased revenue over just the scrap value and a reduction in waste. However this is only applicable if the plant and equipment are desirable to a third party.

In the case of MPS, all the plant and equipment are of a vintage type. This means that it is highly unlikely to be desirable for re-use elsewhere or, if there is interest, the financial gain would be less than the value for scrap. Therefore, most of plant and equipment with the exception of the Gas turbine and the new switchgear should be consigned as scrap.

At MPS the plant and structures to be dismantled/demolished range in construction, from free standing process vessels/tanks etc, to open and closed steel framed process plant/buildings, galbestos clad industrial buildings, traditional concrete/brick/stone built modular buildings and specialist structures.

This mix of structures will result in a wide range of dismantling techniques being used throughout the course of the project.

Typical examples of such techniques are:-

- a. Remote hydraulic machine shearing/pulverizing
- b. Secondary machine processing
- c. Workface hot cutting
- d. Workface cold cutting
- e. Controlled collapse
- f. Dismantling/lifting/removal
- g. Manual removal of asbestos

Dismantling is a high hazard, high risk operation and to ensure that all works are carried out safely, full and comprehensive risk assessments are carried out together with detailed method statements. All dismantling operations will be strictly controlled, to ensure a predictable, safe outcome. Asbestos and galbestos sheeting will be removed by hand, in a controlled fashion while any asbestos insulation will be removed in enclosures with negative air pressure. All the relevant asbestos regulations and working practices will be implemented.

It is currently planned that as per standard industry practice the site will be cleared of all equipment and civil structures up to slab level.

### 6.3 Remediation works

An extensive Soil survey was carried out in 2011 as part of the Full Decommissioning report. The survey was carried out by Environ which involved the core drilling of 29 different samples around MPS site. The samples were tested extensively for various pollutants and compared to a Generic Assessment Criteria developed considering a commercial/industrial future use of the site. Based on these results significant pollution above this GAC was recorded in two sites around the station.

Furthermore the report by Environ states that:

“The investigation indicated that there is no significant contamination of the land resulting from the present activities. However due to the nature of the natural geology any potential contamination is likely to be confined to its source (sump pits etc.)”

It is therefore intended that once the site is cleared more ground testing will be carried out especially in the two areas identified in order to quantify the extent of any contamination. The below ground structures associated with pollution containment will be removed to expose any possible contamination. Remediation activities will be undertaken to leave the site suitable for commercial/industrial use.

## 7. Programme of works

It is anticipated that Overall Decommissioning activities will take place as shown in MPS/POW/001. From this proposed program of works, it can be seen that the commissioning of the interconnector would give Enemalta the opportunity to undertake a phased decommissioning strategy at MPS and enable it to decommission the oldest equipment on site first.

The Decommissioning activities on the oldest plant found at MPS, that is, units 1 to 4 will commence after the interconnector is commissioned. The decommissioning of the balance of plant, that is units 5 to 9 will only commence after the new Gas plant is commissioned at DPS, which is expected to be commissioned in 2016. Dismantling /Demolition of MPS is also shown in MPS/POW/001.

The actual Decommissioning/Dismantling/Demolition plan will be submitted by the actual contractor once appointed and will be in agreement with the Competent Authorities.

The proposed project will involve the demolition of all structures listed in Tables 3.1 to 3.9 and includes the following works:-

- a. Removal of remaining of fuel bottom stock (sludge) from the fuel storage tanks including fuel Tanks of A station and cleaning of Tanks
- b. Neutralization and safe removal of acid plant
- c. Decontamination of site and equipment
- d. Removal of below ground structures associated with pollution containment such as sumps, pits etc.
- e. Dismantling of all mechanical equipment
- f. Dismantling of all electrical equipment
- g. Dismantling of all structural steel work
- h. Deviations of 33KV cables
- i. Demolition of chimneys
- j. Demolition of buildings
- k. Civil structures on top of A station.
- l. Waste management
- m. Finally the site will undergo remediation works which will include Civil works associated with site reinstatement including removal of any ground contamination.

## 8. Waste Issues

Waste is widely defined and includes excess unwanted materials, effluents, unwanted surplus substances, worn out, contaminated or otherwise damaged.

All waste on MPS will be dealt with in accordance with the waste Duty of Care as per LN 184 of 2011.

The waste Hierarchy which will be applied will be

- a. Prevention
- b. Reuse
- c. Recycle
- d. Recovery
- e. Disposal

The Table below gives a very rough indication of the amount of some of the waste expected to be created by the demolition of MPS. The list is not exhaustive and quantities are a rough estimate of what is expected to be generated during the dismantling/demolition process.



Material	Waste Code	Amount m <sup>3</sup>	Amount Tons	End use
Waste Electrical and electronic Equipment	16 02 14	87		Recovery abroad
Cables	17 04 11		98	Recovery Abroad
Transformer oil	13 03 10		184	Re-use
Waste oils	13 02 08		100	Re-cycle & Re-use
Insulation/Mineral wool	17 06 04	2218		
Calcium Silicate	17 06 03	60		
Refractory	16 11 06	117		
Galbestos	17 06 05		65	Disposal abroad
Asbestos cement sheeting	17 06 05		13	Disposal abroad
Asbestos Insulation	17 06 01*	75		Disposal abroad
Stone	17 01 02	2329		
Concrete Brickwork	17 01 07	10290		
Steel	17 04 05		16765	
Copper	17 04 01		253	
Aluminium Brass	17 04 01		328	
Aluminium	17 04 02		42	

Table 15:- Estimated Wastes

## 9. Impacts on the Environment

The cessation of generating activities at MPS is expected to have a positive impact on the environment of the surrounding areas as well as the country as a whole. The equipment in use at MPS is of the vintage type having low efficiencies and hence having a high degree of negative impact on the environment. Once operations from MPS are stopped a positive effect on the Air quality of the surrounding area is expected to be achieved.

However during the demolition, the activities are likely to have short term negative impact on the surrounding areas.

The major concern with the demolition activities are

1. Noise pollution
2. Dust pollution
3. Disposal of Waste

## 9.1 Noise

Demolition activities are normally carried out by heavy equipment and are likely to generate noise. However noise levels will be within acceptable levels and shall comply with the requirements of BS5228: Part 1: 1984: Noise Control on construction and Open sites – code of Practice for Basic Information and Procedure for Noise control or its equivalent.

Demolition activities will be restricted to daylight hours from 07.00 to 17.30 hours on weekdays and Saturdays only. No work will be carried out on Sundays and Public Holidays.

A substantial amount of major civil works like turbine structures are situated inside the turbine hall. It is intended that the turbine hall will be retained during the period demolition of the internal turbine structures so as to reduce the amount of noise levels outside the site boundary.

## 9.2 Dust pollution

Demolition activities are likely to generate dust. Appropriate dust control measures will be deployed, including the use of water sprays where necessary. Adequate measures will be put in place to ensure that vehicles leaving the site do not dirty public roads or deposit mud or other materials onto public streets. All trucks leaving the site will have their tyres washed and the dirty water collected in sumps provided with silt traps. The retention of the turbine hall structure during the demolition of the turbine civil structures will help to mitigate the amount of dust which will be released outside the site boundary.

## 9.3 Waste

As can be seen in Table 23, the amount of waste expected to be generated from the dismantling/demolition phase is likely to be very considerable. A substantial amount of waste such as scrap steel and other metals will be exported for recycling/reuse abroad. Since MPS is situated inside a harbor, whenever possible, it is intended that waste export will be carried out directly from the MPS site in order to avoid increased traffic movement on the roads. Furthermore whenever possible concrete will be crushed on site and used as a fill for pits, cavities etc. In this way disposal of inert waste to landfill is reduced as much as possible. Waste will be segregated on site.

## 9.4 Traffic Management

Construction vehicles and plant will be parked within the site all throughout the demolition phase. No material will be taken from the Application site during traffic peak hours.

No building material, waste or plant shall be allowed to obstruct any movement of traffic and will be kept within the site perimeter itself.

All vehicles used on site will be properly maintained and drivers properly trained and competent. Vehicles will be securely loaded.

#### 9.5 Health and Safety

All regulations relating to Environmental/health and safety will be complied with.

No excavation will be carried out which could undermine or affect the stability of any adjoining property, buildings or services. Where such excavation cannot be avoided, it shall be ensured that adequate protection and support has been approved by the owners.

Access to and from the site will be controlled by a security officer. The site is already fenced off. All barriers, lighting and signs provided to prevent unauthorized access and safety to site staff will be regularly checked and adequately maintained.

Appropriate signage will be erected both in the vicinity of the site as well as on the site perimeter itself to warn third parties about the ongoing demolition activities and restricted access. Mobile onsite amenities will be provided as and when required. These amenities will include a site office and chemical toilets.

The decommissioning/dismantling/demolition contractor engaged on this project will be given clear instructions to use all reasonable precautions to prevent any damage to infrastructural facilities. The contractor will be contractually bound to make good any damage caused to the roads used.

#### 10. Conclusion

The closure of Marsa Power Station will have a positive impact on the air quality of the immediate area surrounding the site. It will also create an area of at least 32,000 m<sup>2</sup> (excluding the area on top of Jesuit Hill) for possible alternative use and development for commercial activities.