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Works Method Statement WMS-03

Turbines

Delimara Power Station

Delimara - Marsaxlokk

Rev.	Date	Details	Prepared by	Reviewed by	Approved by
03	31.05.2017	Review	Roberto Brustia	Mario Sabolo	Mario Sabolo
02	03.04.2017	Review	Roberto Brustia	Mario Sabolo	Mario Sabolo
01	27.03.2017	Review	Roberto Brustia	Mario Sabolo	Mario Sabolo
00	20.03.2017	Draft WMS 03	Roberto Brustia	Mario Sabolo	Mario Sabolo

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00. Site description

Delimara Power Station (DPS) is located on the Delimara Peninsula in Marsaxlokk Bay, on the south east coast of Malta. The site is located at an elevation of between 1.8m and approximately 6.0m metres above local sea level (ALSL).

The site comprises operational plant in the centre and south of site, and a workshop, administration buildings and a First Aid Room in the north of site.


Below some pictures of the Turbines involved in the decommissioning.



Delimara Power Station – Global view



Turbines Hall – Global view

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01. Description of area - structure

The 2 steam turbines are 2 BHEL Steam turbines/Generators rated at 60MW output with all auxiliary equipment found inside the Turbine Hall.

The Turbine Hall structure and site service electrical systems, air compressors, general service water, auxiliary cooling pumps, fire fighting equipment, the pipebridge between the boilers and the Turbine Hall, 2 overhead cranes and some other minor auxiliaries are not included in the removal works.



Example of Turbine

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02. Safety precautions prior to works


- Switching off or protect all live equipment. All works shall be carried out according to Enemalta HSE Policies.
- Part of the Turbines Hall closer to the turbines to be dismantled will be closed during the dismantling works to allow only authorised access of General Smontaggi workers and authorized ENE personnel in charge of the works.
- Area just around the turbines will be cleaned following the dismantling of the turbines and will be disposed of as non-hazardous waste.
- Safety tests and certification of all material and equipment to be used including the overhead cranes handed over from Enemalta.
- Ground operators shall not pass, stand or work in the operating area of the mechanical equipment or suspended loads;
- The area immediately below the works shall be properly delimited with suitable barriers and the transit and standing of people and vehicles shall be prohibited.
- Before carrying out any demolition operations, the site Supervisor of Works shall carefully assess the possibility that the demolition might cause the immediate or successive collapse of other parts.

03. Environmental Issue

- A precautionary approach is being taken, to segregate any hazardous components that might be detected during the course of works. These will be defined from the sampling and subsequent HAZMAT survey.
- Turbines and ancillary pipework contains tens of drums as amount of hazardous liquids such as lube oil that have to be drained and cleaned before of the dismantling of the structures.
- Details of expected waste to be generated is provided in the Waste Management Plan.

04. Works methodology

Dismantling of the 2 steam turbines in Boundary C will be done layer by layer from the outermost to the innermost equipment. This area also comprises 2 generators, 2 condensers, 2 Automatic Voltage Regulators, 4 condensate extraction pumps, 2 low pressure heaters, and 2 reserve feed water tanks. The intermediate floor includes high pressure heaters. Lubricating and jacking oil system is located on the top

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floor level. The ground floor includes feed pumps, 2 lube oil purifiers, 2 air compressor units, 2 drying units, 2 depressurizing panels, and water box priming systems and dosing skids for caustic soda and ammonia. The technique to be used will be disassembly by layers, from outer to inner equipment, paying attention to items to be protected with scaffoldings. Account should be taken that some of them will be removed already in the insulation mineral wool removal phase.

05. Works description

Before commencing any work a Risk Assessment and safe work method statement (RA-SWMS) shall be submitted to Enemalta. The RA-SWMS will be signed by the contractor's H&S representative and shall be followed throughout during project execution. The RA-SWMS shall be updated during the course of the works and made available to Enemalta upon request

First activity will be the removal of lube oil. Operators detect and open the lower point for each turbine that permit the draining by gravity of the oils.

The oils will be collected in appropriate tanks and stored safely on site in a bunded area.

As for all the activities described above, the parts to be removed will be sectioned by hot cutting, while those requiring the mechanical disassembly of components by removing nuts and bolts.

By way of an example: clamps, circuits, carters, motor-driven pumps, pipes, wiring, suction channels, filters and other equipment.

Once the turbines to be removed have been reached, they will be mechanically removed.


During the disassembly, particular attention will be paid to issues related to operators' safety and the identification of each removed item.

It is important that any pipes that pass from the turbine shed to the boiler will be cut and suspended properly on the other boundary.

Enemalta personnel will be marking in red paint all the equipment (except cables and cable trays) that can be removed during the decommissioning activity.

The operators will access high levelled disassembly areas both from the existing surfaces – if possible - and through the aerial platform and by adjusting the means position to the disassembly progress to constantly prevent the risk of fall from height and ensure the best access to the working areas.

Before disassembly, cutting or mechanical lines and gripping points will be marked out.

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Each disassembled part can be slung by bags or cuts or through two or more properly realized holes, depending on the shape, weight and operating space.


For the handling of disassembled parts, given the operating space, it might be necessary to drive some parts through ropes or devices in order to prevent collisions with the structure or equipment not to be disassembled.

Cutting and mechanical disassembling include the following operations, to be cyclically repeated until full removal of each turbine.

Only cables that have been cut from the power supply and a permit to work issued by Enemalta personnel and equipment shall be removed. The contractor shall not remove any cable which has not been cut from both ends by the Enemalta's engineers.

06. Timeframes		
Steps – Turbine 01	Time	
Removing Facilities	15	Days
Crackcase disassembly	10	Days
Demolition turbines	20	Days
Demolition structures	15	Days
Cutting oven ready	30	Days
Restore of areas	25	Days
Waste desposal	25	Days

Steps – Turbine 02	Time	
Removing Facilities	15	Days
Crackcase disassembly	10	Days
Demolition turbines	20	Days
Demolition structures	15	Days
Cutting oven ready	30	Days
Restore of areas	25	Days
Waste desposal	25	Days

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07. Personnel and machinery earmark for use
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Description	Number	
Excavators	01	Units
Machine operator	01	-
Helpers	04	-
Hot cutters	04	-