



-----ENEMALTA DPS IPPC APPLICATION - FORM C-----

APPENDIX K - Sewer Discharge Permit
APPENDIX L – VOC Abatement System Report
APPENDIX M – Enemalta Noise Monitoring Method Statement
APPENDIX N – DPS Noise Monitoring Reports 2014 & 2015
APPENDIX O – NEC Emission Calculations Letter
APPENDIX P - Technically Competent Person - CV

0466 – Enemalta DPS IPPC Application

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TABLE OF CONTENTS

Reference	Document Title	Page
Appendix K	Sewer Discharge Permit	1
Appendix L	VOC Abatement System Report	4
Appendix M	Enemalta DPS - Noise Monitoring Method Statement	29
Appendix N	DPS Noise Monitoring Reports 2014 & 2015	43
Appendix O	NEC Emissions Calculations Letter	132
Appendix P	Technically Competent Person - CV	133

IPPC Delimara Power Station: Noise Method Statement.

Table of Contents

IPPC Delimara Power Station: Noise Method Statement.	1
1. Introduction.....	4
2. Description of the environment.....	4
2.1. Delimara Power Station Site.....	4
2.2. ENE operated plant	7
3. Methodology for monitoring of noise emissions to the environment.	8
3.1. Method 1: Far-field Noise Measurement Monitoring.....	8
3.1.1. Objective.....	8
3.1.2. Monitoring methodology	8
2.1.3. Monitoring frequency and location	10
2.1.4. Interpretation of results	10
2.2. Method 2: Noise mapping exercise.....	12
2.2.1. Objective.....	12
2.2.2. Monitoring Methodology	12
2.2.2.1. Noise Sources	12
2.2.2.2. Path Modeling	13
2.2.2.3. Receivers/NSPs.....	13
2.2.3. Monitoring frequency	13
2.2.4. Interpretation of results	13
4. Application of methodology to other operators.	14
5. Complaints database.	14

Definitions

Title	Description	Abbreviation
Delimara Power Station Phase 1		DPS1
Delimara Power Station Phase 2A		DPS2A
Delimara Power Station Phase 2B		DPS2B
Delimara Power Station Phase 3		DPS3
ElectroGas Malta		EGM
Enemalta plc site		ENE

Table 1: Table of definitions

1. Introduction

The objective of this document is to describe the methodology for monitoring, assessment, and reporting of noise emissions from the Delimara Power Station site using best practicable means (BPM) so as to fulfill the following requirements:

- Assess the likelihood of complaints at noise sensitive receptors resulting from noise emissions generated by all three operators from the Delimara Power Station Site.
- Measure the noise emissions at source generated by the ENE operated plant within DPS Site, the results of which will be presented in a noise contour map. This contour map will be used in case the annual monitoring proves inconclusive with respect to establishing whether the nuisance noise at receptors is emitted from ENE operated plant within DPS site.

2. Description of the environment

Prior to describing the proposed methodology it is first necessary to understand the operational environment in which it is to be applied.

2.1. Delimara Power Station Site

To date the DPS has been operated by a single operator, Enemalta plc. Following the construction of DPS4 and the conversion of D3 to operate on gas, the DPS site shall house Enemalta plc (ENE), Electrogas Malta (EGM) and Delimara 3 Power & Gas (D3PG) – see *Figure 1*. The introduction of EGM's installation will see an increase in the existing DPS site boundary, when considering the FSU and re-gas facilities. As part of the EIA carried as a requirement of the development permit applications PA/00021/14 and PA/00021/14, an assessment of the expected combined noise emission from the DPS site was carried out so as to determine the combined potential impact of noise generated by all three operators. This was done by taking measurements of existing plant on site, determining the noise emissions of the proposed plant and through the use of computer modeling software create a series of

noise contour maps which could be used to assess the combined and individual impact of each plant. Figure 2 below shows an example of one such noise contour map.



Figure 1 The operators within the Delimara Power Station site.

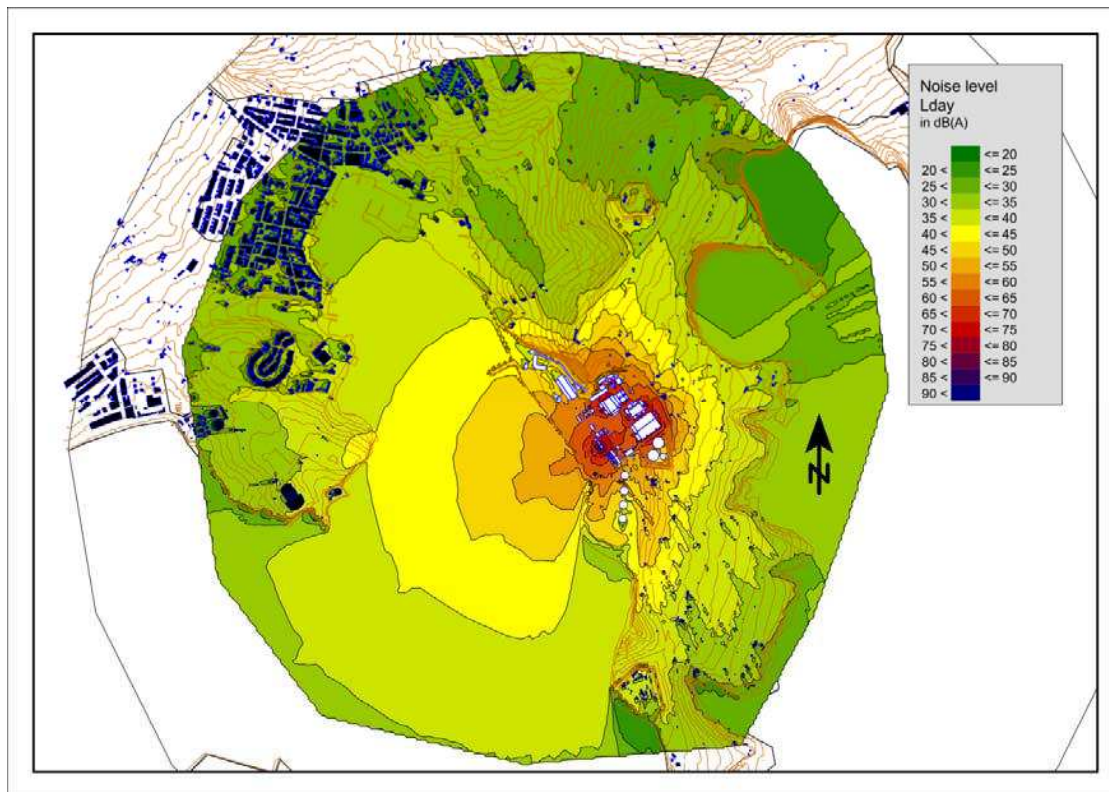


Figure 2 Sample noise contour map.

2.2. ENE operated plant

Following the introduction of the new operators to the site Enemalta will be responsible for the operation of 2 open cycle gas turbines – Phase 2A, expected to operate an estimated maximum of 500 hours per year; and 2 gas turbines and one steam turbine - Phase 2B, expected to operate an estimated maximum of 1500 hours per year. At this point, it is impossible and impractical to predict the hours the steam turbine will be operating, this being subject to the type of emergency occurring, i.e. the steam turbine will need several hours to be brought into operational condition. The need for the steam turbine to be brought into operation would automatically mean that there is an emergency in the gas operated generation, that would be of significant duration or consequentiality. Otherwise, both Phase 2A and B will be in cold standby i.e. non-operational.

3. Methodology for monitoring of noise emissions to the environment.

So as to fulfill the two objectives described in section 1 above, two different methods of approach are required.

3.1. Method 1: Far-field Noise Measurement Monitoring

3.1.1. Objective

To assess the likelihood of complaints at noise sensitive receptors resulting from noise emissions generated by all three operators from the Delimara Power Station Site.

3.1.2. Monitoring methodology

Physical monitoring at remote off site locations during operation shall be utilized. As per previous assessments it is being proposed that BS 4142:2014 shall be implemented with the following changes:

- Previous noise assessment periods using BS 4142:1997 may have resulted in noise measurement uncertainty due to limited measurement time periods and inaccurate measurement of the back ground noise. Such short periods do not represent the source and its possible rating for nuisance. So as to resolve this issue it is being proposed that yearly monitoring at pre-established receptors shall be taken, as indicated in figure 3, however longer time measurement periods shall be utilized to provide better data quality.
- For the purpose of calculating the future Rating level, a suitable background noise level over which a comparison will be made throughout the years is required. A noise monitoring survey in a set of pre established receptors (noted in figure 3 below) shall be taken in 2016, before D4 plant is put in operation, to establish both the background sound level ($L_{A90,T}$ Year 2016) and the ambient noise level L_a ($L_{Aeq,T}$ Year 2016) according to BS4142:2014.
- This shall be calculated as follows: The background sound level ($L_{A90,T}$ Year 2016) and and the ambient noise level L_a ($L_{Aeq,T}$ Year 2016) according to BS4142:2014 will be measured. This in turn will be used for the future rated specific noise level detection and comparison.
- On a yearly basis, the 3 companies at DPS site shall commission a noise survey where the noise rating, $L_{eq} (YEAR n)$, in the same pre established receptors will be monitored over a

minimum period of 3 days. These 3 days will then be subdivided into periods for the assessment to be carried out according to BS4142:2014 and rated accordingly.

- This rating level $L_{Aeq,Tr} (Year\ n)$ shall be deducted to the background noise measured in 2016, $L_{A90,T\ YEAR\ 2016}$. Where it is established that the difference between the background noise calculated in 2016 and the rating level calculated in year n, referred to $\Delta L_{eq} (YEAR\ n)$, is exceeding 5dB, the assessor shall verify whether the noise signature in that particular moment was attributable to DPS site using the previous contour map and noise signatures. A difference between background noise in 2016 and rating level in year n ($\Delta L_{eq} (YEAR\ n)$) that will be attributable to DPS will be used to check for non conformity. The assessor, utilizing the signatures of the noise and the contour map shall identify whether Delimara Plant was responsible for the non conformity and report accordingly. The assessment shall indicate at which time a specific plant was put in service (if required from an operational point of view) and according to the noise signature of each plant, the assessor shall determine whether there was an increase in the noise level once the unit was in stable operation and whether any noise increase is attributable to specific plant being in service. For the purpose of the annual monitoring DPS Site, other than phase 2A and 2B, shall be requested to operate in its normal operation mode.
- It is being recommended to monitor a period of 3 consecutive days subdivided into periods according to BS4142:2014 in order to have a representative Rating Level indicative of any increase in noise as compared to 2016 and whether this increase is attributable to DPS site. During this annual monitoring, one gas turbine each from Enemalta standby plant D2A and D2B, will be put in service for 30 minutes and once in stable operation (excluding startup) surveyor shall note whether during that 30 minute interval there was an increase in the noise rating level that is attributable to Enemalta plant. (From D2A and D2B noise signature). Thus for Enemalta plant, the background noise at the time of measurement will be the ambient noise level just prior to putting in service the gas turbines. This shall constitute the annual monitoring obligation for Enemalta plant. If the difference is less than +5db there will be no actions required from ENE.

2.1.3. Monitoring frequency and location

Physical monitoring is to be carried out annually at the noise sensitive receptors. It is being suggested to measure the rating noise $L_{Aeq,Tr}$ (Year n) in the areas noted below in Figure 3 .



Figure 3 Areas for physical monitoring.

2.1.4. Interpretation of results

Measurements being taken over a period of three days will be subdivided into periods for assessment according to BS4142:2014 and rated accordingly. The results of which will be presented in a table and a rating level, $L_{Aeq,Tr}$ (Year n) attributable to DPS will be reported on according to clause 11 of BS4142:2014.

Monitoring of the site does not only involve noise level measurement but also the review of operational emissions as a paper study. Previous documents involved the heavy use of sound pressure measurements in locations, both on-site and off-site, which could not always be directly connected to

10

the operation of the site or the site's emissions. Hence, it is being suggested that the annual monitoring of the actual emissions from the area is evaluated based on any possible changes to the equipment. This would also need to take into consideration what is happening between the sources and the final receivers or NSPs if any major physical changes occur in the locality. Hence the source-path-receiver would have to be considered to decrease the uncertainty of the present or future situation with regards to the site vis-à-vis the surrounding environment. These parts of the noise climate are handled in different ways using different standards applicable to the type of argument handled. Thus, in case the Rating Level in a specific year n , $L_{Aeq,Tr} (Year\ n)$ exceeds the background noise level as calculated in 2016 by +10dB and the source of this exceedance cannot be established, a comparison between noise mapping in method 2 in that specific year as compared to the contour of 2016 shall be carried out. If the noise mapping exercise in year n is within ± 3 dB, it shall be considered identical to that of 2016, and no further action will be required from Enemalta. However, if the new contour identifies a source with DPS site whose noise increased by over +6dB from the original contour the latter party shall be required to rectify to enter within the previous contour. Once the corrective action is taken, an assessment of the noise at receptors with method 1 shall be taken, however the duration of the test shall only be 3 hours during the day and 1 hour at 3am and the GTs will not be required to be put in service (if they were not the source of the emission). The costs of the new contour map/s and retest at receptors shall be borne by the operator who was not confirming to the +3dB Delta $L_{eq} (YEAR\ n)$, in line with the polluters pay principle.

2.2. Method 2: Noise mapping exercise.

2.2.1. Objective

To measure the noise emissions at source generated by ENE Site to create a noise contour map so as to verify where the plant might have effects on the local communities and what average levels are expected to be contributed from the ENE Site. During the EIA it was determined that should ENE continue to operate D2A and D2B as standby plant, the accumulation of all noise emissions from the DPS site attributable to ENE are to have no noticeable impact on the noise sensitive receptors.

2.2.2. Monitoring Methodology

The Sound Power Level emissions are measured and mapped using software with day and night periods according to ISO1996-2 propagation in all directions from the site, giving a clear picture of the contribution made by equipment to the area.

The noise model used in the Phase 4 EIA will be used to present the data of emissions from the ENE site. The inputs will be the source sound powers with ISO 1996-2 propagation model to the receiver sites and the statistical 50 year weather data of Malta. It is intended to supplement the model with a finer DGM from the LIDAR data supplied under **ERDF 156 data, (2013), *Developing National Environmental Monitoring Infrastructure and Capacity, Malta Environment & Planning Authority.***

The three main components of the noise model are the noise sources, the source-receiver path and the receivers/NSPs.

2.2.2.1. Noise Sources

Considering the various types and size of noise sources on DPS site, operations and equipment will be handled using the following standards.

In all sections of the EIA 2013/2014 regarding Phase 4, the use of ISO 9614-2 was used for different parts and sections of the DPS site. But, if some sections will become impracticable with the de-commissioning of Phase 1 and/or ongoing changes, use of the ISO 37XX series of standards will be used for smaller sections of the site, namely the preferred ISO 3744 or the survey method ISO 3746. Sound power level derived from sound intensity measurements on specific parts of the power station site will

be done according to ISO9614-2. This is the preferred method for data collation to be entered in the area model for representation.

2.2.2.2. Path Modeling

The path between the sources and receivers will be determined and corrected according to ISO1996-2. Considering the data quality obtained during the EIA process, tonality might be assessed.

2.2.2.3. Receivers/NSPs

Cumulative day and night predicted noise levels from Enemalta equipment will be presented in the form of a noise map. The area to be covered is circa 12.5 square kilometers.

2.2.3. Monitoring frequency

This assessment is to be a one-time assessment and shall be a base study for future comparative assessments. It is being suggested that should any other circumstance imply major equipment changes at the DPS Site such assessment be reviewed and any changes thereof declared. Moreover following decommissioning of phase 1, this assessment is to be updated so that this new contour map shall be used in future comparative analysis.

2.2.4. Interpretation of results

The results of this assessment shall be presented in the form of noise contour maps for comparison with previous contour maps.

Should the noise emissions from ENE Site remain unchanged (or within +5 db) from the last contour map submitted to MEPA, ENE site shall be considered to be in conformity and within acceptable noise emission levels.

4. Application of methodology to other operators.

In view of ENE's reduced operational times brought about by cold standby status and the lack of third party nuisance registered over the years, the approach of this document is considered conservative in line with IPPC requirements

The methodologies described in this document are being proposed for ENE Site based on the information made available to date and can be implemented to monitor and assess the impacts from all operators.

5. Complaints database.

Enemalta has been keeping a database of any complaints arising for the past six years. No complaints have been registered till present. This is being maintained via Enemalta customer care department or via the Environmental Officer should indirect response via the Environmental Authority be submitted. This data collection exercise will be maintained.