DESFA
Hellenic Gas Transmission System Operator

HELLENIC GAS TRANSMISSION SYSTEM OPERATOR

357-359, MESSOGION AVE.,
15231 ATHENS, GREECE
Tel.: 210 6501258
Fax : 210 6501551

TECHNICAL JOB SPECIFICATION
900/4
REVISION 0
DATE 29/06/2011

LNG PLANT

NOISE CONTROL

QUALITY ASSURANCE PAGE

CHANGES LOG

REVISIONS LOG

0	**29-06-2011**	**FIRST ISSUE**	**PQ DPT.**	**V.G.**
Rev. No	Rev. Date	REASON FOR CHANGE	Made By	Approved By

CONTENTS

REFERENCE DOCUMENTS

EEMUA (Engineering Equipment and Materials Users Association) No. 140
[Noise Procedure Specification
This specification defines procedures for controlling noise in plant and equipment]

1.0 SCOPE

This Specification defines the engineering criteria for determining the acceptability and control of equipment noise levels.

The intent of this Specification is to satisfy the sound limit requirements of:

- Greek Regulation P.D. No 85/91 issued with F.E.K. 38A first volume dated 18/03/91 for equipment located in main plant operating areas, to protect workers health.

The permissible noise exposure for a worker will be:

a) 85 dB(A) for a continuous exposure of 8 hours per day.

b) 90 dB(A) if workers are equipped with individual ear protection.

- Greek Regulation P.D. No 1180/81 issued with F.E.K. 293A dated 6/10/1981.

The sound pressure levels at plant boundaries shall be lower than the following values:

Purely industrial areas.	70 dB(A)
Areas with industrial installations prevailing.	65 dB(A)
Areas with industrial installations and residential districts.	55 dB(A)
Areas with residential districts prevailing.	50 dB(A)

The operating area where the sound pressure levels are exceeding 85 dB(A) must be clearly indicated by means of warning signals.
Exposure to impulsive or impact noise should not exceed 140 dB as peak sound pressure level.
The unit of measure, dBA, means that decibels are weighted according to the "A scale". Sound levels shall be measured on the "A scale" of a standard sound level meter at SLOW response.
Sound pressure level is referred to a limit value of 20 micro Pascal. Sound power level is referred to a limit value of 10^{-12} Watt.

2.0 NOISE LEVEL CRITERIA

The intent of this specification is that equipment noise levels shall not exceed the overall value of 85 dB(A) measured in the locations as per following **paragraph 4.0.** If equipment does exceed this level the supplier shall state the maximum expected noise level. Supervision shall notify the Owner where selected equipment exceeds this level and where standard noise attenuation devices are not available from the equipment Supplier.

Supervision will not supply noise attenuation treatment unless it is requested by the Owner.

The most practical noise attenuation treatment shall be recommended by the equipment Supplier.

This may, in certain cases, result in resolving the noise problem based on noise level measurements taken on a test stand at the Manufacturer's works or at the actual installation. In this event, Supervision shall obtain full cooperation from the equipment Supplier in furnishing assistance and designs to reach an acceptable resolution of the noise problem. Supervision is not responsible for achieving the equipment Suppliers expected noise level.

Any alternate sound attenuation design purchased shall be guaranteed by the Supplier.

It will be the responsibility of the Owner to ensure that maintenance or other personnel, who must work for longer periods of time in noisy areas exceeding the permissible noise exposures, will be furnished with suitable ear protection and instructions for proper use.

3.0 PROPOSAL REQUIREMENTS

The Supplier shall submit with his proposal the expected sound pressure and sound power levels by octave bands in dB(A) for all noise producing equipment.

If the noise level is marginal or the data inadequate, the Supplier shall submit in his quote a proposal to Owner for a noise level test including a description of the proposed test procedures.

When noise testing is required, test, data, calculations, and a sketch indicating microphone positions, equipment size, climatic conditions, and complete description of the test site shall be furnished.

When the prescribed noise levels cannot be satisfied with the Supplier's standard design, alternates for design modifications and/or acoustic treatment shall be quoted.

The Supplier's proposal shall fully describe design modifications for noise reduction and provide the cost, and effect on performance.

When an acoustic treatment alternate is quoted, the proposal shall contain full details on composition and mounting of acoustic materials, cost and effect on performance. The expected noise levels shall be based on measurements of operating equipment of similar design or industry acceptable methods of calculation.

4.0 SOUND PRESSURE MEASUREMENT

The sound levels for mechanical equipment shall be measured in accordance with **EEMUA Publication No 140.**

Whenever possible and sound tests shall be made with the machine operating at rated speed and rated horsepower. If this operating condition cannot be obtained, then sound tests may be made at some other condition mutually agreed upon by the parties concerned, and this condition shall be clearly described in the test report.

Measurement locations in addition to these contained shall include all connected process piping 1 m. from the casing-piping connection at a radial distance of 1 m. from the pipe surface.

Sound pressure measurement locations relative to specific equipment or installations shall be as follows:

Equipment	Sound Pressure Level Measurement Location
Boiler	1 m from burner casing and forced draft ducting and 1 m. from boiler wall on platform
Diesel or gas engine	1 m from casing.
Mechanical Agitator	1 m from agitator.
Motor	1 m from motor.
Pump	1 m from pump.
Control Valve	1 m downstream of valve and 1 m from surface of pipe.

The 1 m distance is horizontal in a plan view.

The noise measurements shall be made at the location of a working platform, which may not be the noisiest location in the area surrounding the equipment. If there is no operating platform for the equipment, the noise measurement shall be made at the noisiest location.