

Petroleum road tanker drivers:
Evaluation and exposure to noise

PETROLEUM ROAD TANKER DRIVERS:
EVALUATION AND CONTROL OF EXPOSURE TO NOISE

Nov 2014

Published by

ENERGY INSTITUTE, LONDON

The Energy Institute is a professional membership body incorporated by Royal Charter 2003
Registered charity number 1097899

The Energy Institute (EI) is the chartered professional membership body for the energy industry, supporting over 19 000 individuals working in or studying energy and 250 energy companies worldwide. The EI provides learning and networking opportunities to support professional development, as well as professional recognition and technical and scientific knowledge resources on energy in all its forms and applications.

The EI's purpose is to develop and disseminate knowledge, skills and good practice towards a safe, secure and sustainable energy system. In fulfilling this mission, the EI addresses the depth and breadth of the energy sector, from fuels and fuels distribution to health and safety, sustainability and the environment. It also informs policy by providing a platform for debate and scientifically-sound information on energy issues.

The EI is licensed by:

- the Engineering Council to award Chartered, Incorporated and Engineering Technician status;
- the Science Council to award Chartered Scientist status, and
- the Society for the Environment to award Chartered Environmentalist status.

It also offers its own Chartered Energy Engineer, Chartered Petroleum Engineer and Chartered Energy Manager titles.

A registered charity, the EI serves society with independence, professionalism and a wealth of expertise in all energy matters.

This publication has been produced as a result of work carried out within the Technical Team of the EI, funded by the EI's Technical Partners. The EI's Technical Work Programme provides industry with cost-effective, value-adding knowledge on key current and future issues affecting those operating in the energy sector, both in the UK and internationally.

For further information, please visit <http://www.energyinst.org>

The EI gratefully acknowledges the financial contributions towards the scientific and technical programme from the following companies

BG Group	Premier Oil
BP Exploration Operating Co Ltd	RWE npower
BP Oil UK Ltd	Saudi Aramco
Centrica	Scottish Power
Chevron	SGS
ConocoPhillips Ltd	Shell UK Oil Products Limited
Dana Petroleum	Shell U.K. Exploration and Production Ltd
DONG Energy	SSE
EDF Energy	Statkraft
ENI	Statoil
E. ON UK	Talisman Sinopec Energy UK Ltd
ExxonMobil International Ltd	Total E&P UK Limited
International Power	Total UK Limited
Kuwait Petroleum International Ltd	Tullow
Maersk Oil North Sea UK Limited	Valero
Murco Petroleum Ltd	Vattenfall
Nexen	Vitol
Phillips 66	World Fuel Services

However, it should be noted that the above organisations have not all been directly involved in the development of this publication, nor do they necessarily endorse its content.

Copyright © 2014 by the Energy Institute, London.

The Energy Institute is a professional membership body incorporated by Royal Charter 2003.

Registered charity number 1097899, England

All rights reserved

No part of this book may be reproduced by any means, or transmitted or translated into a machine language without the written permission of the publisher.

ISBN 978 0 85293 719 8

Published by the Energy Institute

The information contained in this publication is provided for general information purposes only. Whilst the Energy Institute and the contributors have applied reasonable care in developing this publication, no representations or warranties, express or implied, are made by the Energy Institute or any of the contributors concerning the applicability, suitability, accuracy or completeness of the information contained herein and the Energy Institute and the contributors accept no responsibility whatsoever for the use of this information. Neither the Energy Institute nor any of the contributors shall be liable in any way for any liability, loss, cost or damage incurred as a result of the receipt or use of the information contained herein.

Hard copy and electronic access to EI and IP publications is available via our website, www.energypublishing.org.

Documents can be purchased online as downloadable pdfs or on an annual subscription for single users and companies.

For more information, contact the EI Publications Team.

e: pubs@energyinst.org

CONTENTS

	Page
Foreword	2
Acknowledgements	3
1 Summary	4
2 Introduction	5
3 Noise and hearing	6
3.1 The nature of noise	6
3.2 Sound pressure level (SPL)	6
3.3 Noise exposures	7
3.4 Noise and hearing	7
3.5 Tinnitus	8
4 Legislation and standards	9
5 Sources of noise exposure	10
6 Methods for the measurement of noise exposure	11
6.1 Approaches to measurement of noise levels	11
6.2 Microphone location	11
6.3 Sound level meters (SLMs) and dosimeters	12
6.4 Protocols for assessment of noise exposure	12
7 Guidance on controls	14
7.1 Short-term controls	14
7.1.1 Noise from the radio/compact disc (CD) player/entertainment system	14
7.1.2 Noise from the opening the driver's window	14
7.1.3 Noise from driving style	14
7.1.4 Noise from cargo pumps and compressors	15
7.1.5 Hearing protection programme	15
7.1.6 Pre-driving vehicle inspection	15
7.2 Longer term improvements	15
7.2.1 Design and maintenance of vehicles and cabs	15
7.2.2 Design of terminals and loading racks	16
7.2.3 Design of delivery points	16
7.3 Information, instruction and training	16
8 Conclusions	18
9 References	19
Annexes:	
Annex A Measurement of noise exposure - personnel, protocol and equipment	20
Annex B Summary of results from 2002 Noise Monitoring Study	27

FOREWORD

Petroleum road tanker drivers may be exposed to moderate, but potentially significant, levels of noise exposure whilst at work. This document reviews the health effects of noise and occupational exposure data from several companies. It also reviews sources of noise and suggests methods to reduce exposure to as low as is reasonably practicable.

Although it is believed that the adaption of this guidance will help reduce the exposure of road tanker drivers to noise, the Energy Institute (EI) cannot accept any responsibility of whatsoever kind for loss or damage or alleged loss or damage arising or otherwise occurring as a consequence of its use.

ACKNOWLEDGEMENTS

The update of this guidance was commissioned by the EI's Occupational Health and Hygiene Committee (OHHC) and the work was undertaken by a sub-group of the committee.

The EI wishes to thank members of this sub-group for guiding this to completion. In particular:

Mark Elsome	P66
Neil Grace	Centrica
Patrick Kane	
Sarah Leeson	ExxonMobil
Lynne Morgan	EI Morgan Ltd

The EI would also like to acknowledge the contributions of members of the OHHC including representatives from the following companies/organisations:

BG Group
BP
C-CHEC
Centrica
Chevron
ConocoPhillips
EI Morgan Ltd
ExxonMobil
Hawkes Associates
HSE
Jaguar and Land Rover
Nexen
Petrofac
Shell
Talisman Energy
Valero

The information contained in this publication is provided as guidance only and while every reasonable care has been taken to ensure the accuracy of its contents, the EI cannot accept any responsibility for any action taken, or not taken, on the basis of this information. The EI shall not be liable to any person for any loss or damage which may arise from the use of any of the information contained in any of its publications.

The above disclaimer is not intended to restrict or exclude liability for death or personal injury caused by own negligence.

1 SUMMARY

In 2002, the EI (then Institute of Petroleum) published *Petroleum Road Tanker Drivers: Evaluation and Control of exposure to noise*. That document was developed to provide a framework within which the noise exposure of petroleum road tanker drivers may be recognised, evaluated and controlled.

Since the original publication, the Health and Safety Executive (HSE) has published new occupational exposure limits (as required by EU Directive) for noise at work. This second edition of the EI guidance updates the legislative references.

As with the previous edition, this document also considers:

- Effects of noise on hearing at noise levels in the range experienced by petroleum road tanker drivers.
- A brief review of action levels and in-house exposure limits relating to occupational noise exposure.
- A summary of existing noise measurement results.
- A protocol for measurement of noise exposures, and control methods tailored to petroleum road tanker drivers.

There are several noise sources which may be controlled in any particular situation and these include: the cab radio or mobile phone; the driver's window; the cargo pump used to offload product from some road tankers; noise exposure in depots and at loading racks; noise exposure at the delivery point, and noise exposure during the pre-driving vehicle inspection. Additionally, programmes for information, instruction and training and for the use of hearing protection devices are also identified as being important in the control of exposure.

2 INTRODUCTION

Petroleum road tanker drivers may be exposed to moderate but potentially significant levels of noise whilst at work. However, the noise field within a vehicle cab is complex and simple noise measurement methodologies may give data which may not be representative of the actual driver's noise exposure. Standard methods exist for the measurement of noise in vehicle cabs under test conditions but these are not readily useable techniques for occupational noise exposure evaluation. In addition, such tests do not take into account variations in noise levels due for instance to variable road conditions or loading and unloading practices, all of which contribute to the overall noise exposure of a driver.

This document reviews the health effects of noise and occupational exposure data in order to establish if the concerns are founded. It also reviews the sources of noise and suggests methods to be followed which will help control the noise at source and procedural means in order to reduce exposures to as low as is reasonably practicable.

Since 2002 there have been a number of changes to United Kingdom (UK) regulations controlling noise at work, including changes to the occupational exposure limits. Members of the EI's OHHC have reviewed and revised the original text in light of these changes. This second edition contains current information on the UK legislation.

Surveys of road tanker drivers' personal exposure to noise carried out since 2002 highlight that the noise sources of concern continue to be the same as those in the 2002 study (i.e. open windows, car radios or mobile phones, road noise, etc.).