



Development of an intermediate societal risk methodology

An investigation of FN curve representation

Addendum to RR283

Prepared by **ERM Risk Ltd** for the
Health and Safety Executive 2005

RESEARCH REPORT 283(ADD)



Development of an intermediate societal risk methodology

An investigation of FN curve representation

Addendum to RR283

Quinn, D.J. and Davies, P.A.
ERM Risk Ltd
8 Cavendish Square
London
W1G 0ER

The Health and Safety Executive (HSE) commissioned Environmental Resources Management (ERM) to undertake a study for the 'Development of an Intermediate Societal Risk Methodology'. The study was performed between May and October 2003, and revised in August 2004. The study was published on HSE's web site as a HSE research report in 2004 (RR 283).

The following sections form an addendum to the HSE research report 283 (RR283) and describe the calculations and results for 'expectation values' for the base cases detailed in RR283. Therefore, specific details of the cases are not reproduced here and reference should be made to RR283.

This report and the work it describes were funded by the Health and Safety Executive (HSE). Its contents, including any opinions and/or conclusions expressed, are those of the authors alone and do not necessarily reflect HSE policy.

© *Crown copyright 2005*

First published 2005

ISBN 0 7176 6113 X

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without the prior written permission of the copyright owner.

Applications for reproduction should be made in writing to:
Licensing Division, Her Majesty's Stationery Office,
St Clements House, 2-16 Colegate, Norwich NR3 1BQ
or by e-mail to hmsolicensing@cabinet-office.x.gsi.gov.uk

The Health and Safety Executive (HSE) commissioned Environmental Resources Management (ERM) to undertake a study for the 'Development of an Intermediate Societal Risk Methodology'. The study was performed between May and October 2003, and revised in August 2004. The study was published as a HSE research report in 2004 (number 283).

The following sections form an addendum to the HSE research report 283 (RR283) and describe the calculations and results for 'expectation values' for the base cases detailed in RR283. Therefore, specific details of the cases are not reproduced here and reference should be made to RR283.

The results for the expectation value (EV) and maximum number of persons harmed (N_{\max}) are summarised in *Table 1.1*.

The expectation value (sometimes referred to as potential loss of life or rate of harm) is the average number of persons receiving the specified level of harm (i.e. fatality) per year, calculated by summing the products of impact frequency, harm probability and number of persons affected.

Table 1.1 Results Summary

Case	Population	EV	N _{max}
<i>Chlorine installation 1</i>			
All scenarios 1-44	High	1733	1455
All scenarios 1-44	Medium	1103	1150
All scenarios 1-44	Low	1639	1275
Scenarios 1-5	High	369.1	352
Scenarios 6-12	High	8.6	83
Scenarios 13-21	High	123.7	101
Scenarios 22-31	High	756.4	1455
Scenarios 32-35	High	112.8	107
Scenarios 36-43	High	361.9	91
Scenario 44	High	0.6	1
<i>Chlorine installation 2</i>			
All scenarios 1-51	High	6587	4515
All scenarios 1-51	Medium	4203	3852
All scenarios 1-51	Low	6319	3932
Scenarios 1-5	High	3289	352
Scenarios 6-12	High	8.6	83
Scenarios 13-21	High	122.9	101
Scenarios 22-31	High	2456	4515
Scenarios 32-35	High	112.7	107
Scenarios 36-43	High	373.3	96
Scenarios 44-51	High	224.3	87
<i>Chlorine installation 3</i>			
All scenarios 1-13	High	3006	39
All scenarios 1-13	Medium	918	8
All scenarios 1-13	Low	2912	20
<i>Hydrogen fluoride installation</i>			
All scenarios 1-69	High	593	460
All scenarios 1-69	Medium	368	273
All scenarios 1-69	Low	547	337
<i>Liquefied flammable gas processing plant</i>			
All scenarios 1-13	General + housing + school	5656	56
All scenarios 1-13	General + housing	5593	52
All scenarios 1-13	General	5217	45
Scenarios 1-3	General + housing + school	1843	22
Scenarios 4-8	General + housing + school	2190	49
Scenarios 9-10	General + housing + school	5.5	2
Scenarios 11-12	General + housing + school	30.1	3
Scenario 13	General + housing + school	1588	56
<i>LPG distribution depot</i>			
All scenarios 1-24	General + housing + school	51631	148
All scenarios 1-24	General + housing	51382	143
All scenarios 1-24	General	49123	111
Scenarios 1-3	General + housing + school	15535	27
Scenarios 4-6	General + housing + school	5170	27
Scenarios 7-11	General + housing + school	2998	148
Scenarios 12-16	General + housing + school	2343	116
Scenarios 17-18	General + housing + school	5.5	2
Scenarios 19-20	General + housing + school	30.1	3
Scenarios 21	General + housing + school	4535	56
Scenarios 22-24	General + housing + school	21015	10

Notes

1. EV - expectation value (fatalities per million years of plant operation).
2. N_{max} - maximum number of persons harmed.



MAIL ORDER

HSE priced and free publications are available from:
HSE Books
PO Box 1999
Sudbury
Suffolk CO10 2WA
Tel: 01787 881165
Fax: 01787 313995
Website: www.hsebooks.co.uk

RETAIL

HSE priced publications are available from booksellers

HEALTH AND SAFETY INFORMATION

HSE Infoline
Tel: 0845 345 0055
Fax: 0845 408 9566
e-mail: hseinformationservices@natbrit.com
or write to:
HSE Information Services
Caerphilly Business Park
Caerphilly CF83 3GG

HSE website: www.hse.gov.uk

RR 283(add)

£10.00

ISBN 0-7176-6113-X

