HSE Science and Research Publications 2016

- Journal Papers
- Conference Papers
- Conference Abstracts & Posters
- Trade and Professional Magazine Articles
- National Statistics
- Published Interviews with HSE Scientists and Analysts
- Reports by HSE Scientists and Expert Committees
- Reports Prepared for HSE by Other Organisations

Annual Science Review

The Annual Science Review showcases HSE's science and research achievements. It demonstrates how we use science and evidence to improve the management of work-related risk

Download Annual Science Review 2016

Journal Papers

BARBER, C. and FISHWICK, D. Pneumoconiosis. *Medicine*, 2015, 44 (6), 355-358 Respiratory Disorders (Part 3 of 3), http://dx.doi.org/10.1016/j.mpmed.2016.03.001

BARBER, C., WIGGANS, R. and FISHWICK, D. Estimating lifetime asbestos exposure in patients with idiopathic pulmonary fibrosis. *Annals of Occupational Hygiene*, 2016, 60 (5), 649-650, http://dx.doi.org/10.1093/annhyg/mew017 (open access)

BARBER, C., WIGGANS, R., YOUNG, C. and FISHWICK, D. UK asbestos imports and mortality due to idiopathic pulmonary fibrosis. *Occupational Medicine,* 2016, 66 (2), 106-111, http://dx.doi.org/10.1093/occmed/kqv142 (open access)

BARNES, J., MORRIS, A., WELSH, R., SUMMERSKILL, S., MARSHALL, R., KENDRICK, D., LOGAN, P., DRUMMOND, A., CONROY, S., FILDES, B. and BELL, J. Injuries to older users of buses in the UK. *Public Transport,* 2016, 8 25-38, http://dx.doi.org/10.1007/s12469-015-0113-8 (open access)

BASU, S., POOLE, J. and ADISESH, A. Developing a student-selected component for undergraduate occupational medicine. *The Clinical Teacher,* 2016, 13 (5), 363-368, http://dx.doi.org/10.1111/tct.12451

BATT, R., GANT, S., LACOME, J. M. and TRUCHOT, B. Modelling of stably-stratified atmospheric boundary layers with commercial CFD software for use in risk assessment. *Chemical Engineering Transactions,* 2016, 48 61-66, http://dx.doi.org/10.3303/CET1648011 (open access)

BRERETON, P. and PATEL, J. Buy quiet as a means of reducing workplace noise. *Acoustics Australia*, 2016, 44 (1), 55-65, http://dx.doi.org/10.1007/s40857-016-0051-x (open access)

BROUWER, D., BOESSEN, R., VAN DUUREN-STUURMAN, B., BARD, D., MOEHLMANN, C., BEKKER, C., FRANSMAN, W. and KLEIN ENTINK, R. Evaluation of the performance of decision rules in a tiered approach strategy for assessing exposure to nano-objects and their agglomerates and aggregates. *Annals of Occupational Hygiene,* 2016, 60 (8), 949-959, http://dx.doi.org/10.1093/annhyg/mew045

BROUWER, D., SPAAN, S., ROFF, M., SLEEUWENHOEK, A. J., TUINMAN, I., GOEDE, H., VAN DUUREN-STUURMAN, B., LARESE FILON, F., BELLO, D. and CHERRIE, J. Occupational dermal exposure to nanoparticles and nano-enabled products: part 2, exploration of exposure processes and methods of assessment. *International Journal of Hygiene and Environmental Health,* 2016, 219 (6), 503-512, http://dx.doi.org/10.1016/j.ijheh.2016.05.003

BRUECK, L. Measuring the risk of impulsive noise at work: one practitioner's tips. *Acoustics Australia,* 2016, 44 (1), 77-81, http://dx.doi.org/10.1007/s40857-016-0045-8 (open access)

BURDEN, N., BENSTEAD, R., CLOOK, M., DOYLE, I., EDWARDS, P., MAYNARD, S., RYDER, K., SHEAHAN, D., WHALE, G., VAN EGMOND, R., WHEELER, J. and HUTCHINSON, T. Advancing the 3Rs in regulatory ecotoxicology: a pragmatic cross-sector approach. *Integrated Environmental Assessment and Management,* 2016, 12 (3), 417-21, http://dx.doi.org/10.1002/ieam.1703 (open access)

BURDETT, G., DEWBERRY, K. and STAFF, J. Airborne asbestos exposures from warm air heating systems in schools. *Annals of Occupational Hygiene,* 2016, 60 (1), 27-39, http://dx.doi.org/10.1093/annhyg/mev062 (open access)

BUTLER, O., CAIRNS, W., COOK, J. and DAVIDSON, C. Atomic spectrometry update - a review of advances in environmental analysis. *Journal of Analytical Atomic Spectrometry,* 2016, 31 (1), 35-89, http://dx.doi.org/10.1039/C5JA90061A

BUTLER, O., CLOUGH, R., COOK, J., EVANS, E. H., FISHER, A., HILL, S., TAYLOR, A. and WEST, M. Current trends: a perspective from 30 years of Atomic Spectrometry Updates. *Journal of Analytical Atomic Spectrometry,* 2016, 31 (1), 32-34, http://dx.doi.org/10.1039/C5JA90056E

CHAPLIN, Z. Failure data within PIPIN. *Chemistry Today,* 2016, 34 (3), 44-47, http://www.teknoscienze.com/articles/chimica-oggi-chemistry-today-failure-data-within-pipin-the-health-and-safety-executive-rsquo-s.aspx#.V16SJ-Jp9pi (open access)

COLDRICK, S. Modelling small-scale flashing propane jets. *Chemical Engineering Transactions,* 2016, 48 73-78, http://dx.doi.org/10.3303/CET1648013 (open access)

CROOK, B., FARRANT, J., MAKISON BOOTH, C. and BESWICK, A. Scenario-based assessment of decontamination methodology for biosafety and biosecurity applications. *International Journal of Infectious Diseases,* 2016, 53 (Supp), 53-54, http://dx.doi.org/10.1016/j.ijid.2016.11.138 (open access)

DE MATTEIS, S., JARVIS, D., HUTCHINGS, S., DARNTON, A., FISHWICK, D., SADHRA, S., RUSHTON, L. and CULLINAN, P. Occupations associated with COPD risk in the large population-

based UK Biobank cohort study. *Occupational & Environmental Medicine*, 2016, 73 (6), 378-384, http://dx.doi.org/10.1136/oemed-2015-103406

EDWARDS, J. and BUCKLEY, P. Customer-perpetrated work-related violence: prevalence and trends in Britain. *Occupational Medicine*, 2016, 66 (7), 522-527, http://dx.doi.org/10.1093/occmed/kqw038

EYRE, M., FOSTER, P., HALLAS, K. and SHAW, R. The use of laser scanning as a method for measuring stairways following an accident. *Survey Review,* 2016, 48 (347), 121-129, http://dx.doi.org/10.1179/1752270615Y.0000000014

FISHWICK, D. and CURRAN A. From cotton mills to composites; has the world of work really changed? *Industrial Health,* 2016, 54 (1), 1-3, http://dx.doi.org/10.2486/indhealth.54_101 (open access)

FISHWICK, D., SEN, D., BARKER, P., CODLING, A., FOX, D. and NAYLOR, S. Health surveillance for occupational asthma in the UK. *Occupational Medicine,* 2016, 66 (5), 365-370, http://dx.doi.org/10.1093/occmed/kqw028 (open access)

GEARY, W. and PARROTT, R. Two corrosion under insulation failure case studies. *Loss Prevention Bulletin*, 2016, 250 2-6

GILHAM, C., RAKE, C., BURDETT, G., NICHOLSON, P., DAVISON, L., FRANCHINI, A., CARPENTER, J., HODGSON, J., DARNTON, A. and PETO, J. Pleural mesothelioma and lung cancer risks in relation to occupational history and asbestos lung burden. *Occupational & Environmental Medicine,* 2016, 73 (5), 290-299, http://dx.doi.org/10.1136/oemed-2015-103074 (open access)

GORCE, J.-P. and ROFF, M. Immediate screening of lead exposure in the workplace using portable x-ray fluorescence. *Journal of Occupational and Environmental Hygiene,* 2016, 13 (2), 102-111, http://dx.doi.org/10.1080/15459624.2015.1091959 (open access)

GRANGE, J. A., STEPHENS, R., JONES, K. and OWEN, L. The effect of alcohol hangover on choice response time. *Journal of Psychopharmacology,* 2016, 30 (7), 654-661, http://dx.doi.org/10.1177/0269881116645299

GRIFFIN, M. J. and CURRAN, A. Response to article by Prof. Hans Kromhout, Hygiene without numbers. *Annals of Occupational Hygiene*, 2016, 60 (9), 1116-1117, http://dx.doi.org/10.1093/annhyg/mew054

HARRIS, C. E., PALMER, K. T., COX, V., DARNTON, A., OSMAN, J. and COGGON, D. Trends in mortality from occupational hazards among men in England and Wales during 1979-2010. *Occupational & Environmental Medicine*, 2016, 73 (6), 385-393, http://dx.doi.org/10.1136/oemed-2015-103336

HARRIS, W. and BIRKITT, K. Analysis of the failure of an offshore compressor crankshaft. *Case Studies in Engineering Failure Analysis,* 2016, 7 50-55, http://dx.doi.org/10.1016/j.csefa.2016.07.001 (open access)

HEWITT, S., DONG, R., MCDOWELL, T. and WELCOME, D. The efficacy of anti-vibration gloves. *Acoustics Australia,* 2016, 44 (1), 121-127, http://dx.doi.org/10.1007/s40857-015-0040-5 (open access)

HOYES, J. and IVINGS, M. CFD modelling of hydrogen stratification in enclosures: model validation and application to PAR performance. *Nuclear Engineering and Design*, 2016, 310 142-153, http://dx.doi.org/10.1016/j.nucengdes.2016.08.036 (open access)

HSU, J., SHAW, R., NOVAK, A., LI, Y., ORMEROD, M., NEWTON, R., DUTTA, T. and FERNIE, G. Slip resistance of winter footwear on snow and ice measured using maximum achievable incline. *Ergonomics,* 2016, 59 (5), 717-728, http://dx.doi.org/10.1080/00140139.2015.1084051

LEE, T., THORPE, A., CAUDA, E. and HARPER, M. Calibration of high flow rate thoracic size selective samplers. *Journal of Occupational and Environmental Hygiene,* 2016, 13 (6), D93-D98, http://dx.doi.org/10.1080/15459624.2016.1153804

LEESE, E., MORTON, J., GARDINER, P. and CAROLAN, V. A. Development of a method for the simultaneous detection of Cr(III) and Cr(VI) in exhaled breath condensate samples using uLC-ICP-MS. *Journal of Analytical Atomic Spectrometry,* 2016, 31 (4), 924-933, http://dx.doi.org/10.1039/C5JA00436E (open access)

LOIZOU, G. Animal-free chemical safety assessment. *Frontiers in Pharmacology,* 2016, 7 218, http://dx.doi.org/10.3389/fphar.2016.00218 (open access)

MCNALLY, K., FAHAD, M., TAN, E., WARREN, N., HALL, G. and MARSDEN, B. A numerical study of internal brick stresses in AGR moderator bricks. *Nuclear Engineering and Design,* 2016, 309 277-293, http://dx.doi.org/10.1016/j.nucengdes.2016.09.007

MASON, H., SMITH, I., EVANS, G., GOMEZ-OLLES, S., CRUZ, M.-J., BALDWIN, P., STAGG, S. and SMITH, G. Levels of soya aeroallergens during dockside unloading as measured by personal and static sampling. *Archives of Industrial Hygiene and Toxicology,* 2016, 66 (1), 23-28, http://dx.doi.org/10.1515/aiht-2015-66-2577 (open access)

MELLOR, N., INGRAM, L., VAN HUIZEN, M., ARNOLD, J. and HARDING, A.-H. Mindfulness training and employees' wellbeing. *International Journal of Workplace Health Management,* 2016, 9 (2), 126-145, http://dx.doi.org/10.1108/IJWHM-11-2014-0049 (open access)

MOGRIDGE, R., STACEY, P. and FORDER, J. A new miniature respirable sampler for in-mask sampling: part 2 - tests performed inside the mask. *Annals of Occupational Hygiene*, 2016, 60 (9), 1084-1091, http://dx.doi.org/10.1093/annhyg/mew051 (open access)

PETO, J., GILHAM, C., RAKE, C., DARNTON, A., HODGSON, J. and BURDETT, G. Authors' reply to letters from Egliman et al and Oliver et al. *Occupational & Environmental Medicine,* 2016, 73 (10), 710-711, http://dx.doi.org/10.1136/oemed-2016-103870 (open access)

PITTS, P. and BRERETON, P. The development and use of tools to support workplace hand-arm vibration exposure evaluation. *Acoustics Australia,* 2016, 44 (1), 113-120, http://dx.doi.org/10.1007/s40857-016-0043-x (open access)

POOLE, J. and CLEVELAND, T. Vascular hand-arm vibration syndrome - magnetic resonance angiography. *Occupational Medicine,* 2016, 66 (1), 75-78, http://dx.doi.org/10.1093/occmed/kqv151 (open access)

POOLE, J., MASON, H. and HARDING, A.-H. The relationship between clinical and standardised tests for hand-arm vibration syndrome *Occupational Medicine,* 2016, 66 (4), 285-291, http://dx.doi.org/10.1093/occmed/kqw013 (open access)

SADHRA, S., KURMI, O., CHAMBERS, H., LAM, K., FISHWICK, D. and THE OCCUPATIONAL COPD RESEARCH GROUP Development of an occupational airborne chemical exposure matrix. *Occupational Medicine,* 2016, 66 (5), 358-364, http://dx.doi.org/10.1093/occmed/kqw027 (open access)

SAMS, C., JONES, K., GALEA, K., MACCALMAN, L., COCKER, J., TEEDON, P., CHERRIE, J. and VAN TONGEREN, M. Development of a biomarker for penconazole: a human oral dosing study and a survey of UK residents' exposure. *Toxics,* 2016, 4 (2), 10, http://dx.doi.org/10.3390/toxics4020010 (open access)

SIMPSON, A. T., HEMINGWAY, M. and SEYMOUR, C. Dangerous (toxic) atmospheres in UK wood pellet and wood chip fuel stores. *Journal of Occupational and Environmental Hygiene,* 2016, 13 (9), 699-707, http://dx.doi.org/10.1080/15459624.2016.1167279 (open access)

STACEY, P., THORPE, A. and ECHT, A. Performance of high flow personal respirable samplers when challenged with mineral aerosols of different particle size distributions. *Annals of Occupational Hygiene,* 2016, 60 (4), 479-492, http://dx.doi.org/10.1093/annhyg/mev097 (open access)

STACEY, P., THORPE, A., MOGRIDGE, R., TAEKHEE, L. and HARPER, M. A new miniature respirable sampler for in-mask sampling: part 1 - particle size selection performance. *Annals of Occupational Hygiene*, 2016, 60 (9), 1072-1083, http://dx.doi.org/10.1093/annhyg/mew053 (open access)

TAYLOR, A., BARLOW, N., DAY, M. P., HILL, S., PATRIARCA, M. and WHITE, M. Atomic spectrometry update: review of advances in the analysis of clinical and biological materials, foods and beverages. *Journal of Analytical Atomic Spectrometry*, 2016, 31 (3), 554-596, http://dx.doi.org/10.1039/C6JA90005D

VAUGHAN, N., RAJAN-SITHAMPARANADARAJAH, B. and ATKINSON, R. Evaluation of RPE-Select: A web-based respiratory protective equipment selector tool. *Annals of Occupational Hygiene,* 2016, 60 (7), 900-912, http://dx.doi.org/10.1093/annhyg/mew035 (open access)

WIGGANS, R., EVANS, G., FISHWICK, D. and BARBER, C. Asthma in furniture and wood processing workers: a systematic review. *Occupational Medicine,* 2016, 66 (3), 193-201, http://dx.doi.org/10.1093/occmed/kqv149 (open access)

Conference Papers

ALDRIDGE, T., GUNAWAN, O., CRUSE, H., DONALD, K., ROCHE, N. and MUNDAY, M. Modelling the human and economic costs of major industrial accidents. *Hazards 26*, Edinburgh, UK, 24-26 May 2016, Paper 46, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Paper-46.pdf (open access)

ALDRIDGE, T., GUNAWAN, O., MOORE, R., COLE, S. and PRICE, D. A surface water flooding impact library for flood risk assessment. E3S Web of Conferences: 3rd European Conference on Flood Risk Management (FLOODrisk 2016), Lyon, France, 17th-21st Oct 2016, 18006, http://dx.doi.org/10.1051/e3sconf/20160718006 (open access)

ATKINSON, G., COWPE, E., HALLIDAY, J. and PAINTER, D. A review of very large vapor cloud explosions. '*Beyond Regulatory Compliance, Making Safety Second Nature' Mary Kay O'Connor Process Safety Symposium: 19th Annual International Symposium*, College Station, Texas, USA, 25-27 October 2016, (open access)

ATKINSON, G., COWPE, E. and PAINTER, D. Application of detonation diagnostics to the Flixborough Explosion. *Hazards 26*, Edinburgh, UK, 24-26 May 2016, Poster 12, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Poster-12.pdf (open access)

ATKINSON, G., BETTERIDGE, S., HALL, J., HOYES, J. and GANT, S. Experimental determination of the rate of flame spread across LNG pools. *Hazards 26*, Edinburgh, UK, 24-26 May 2016, Paper 19

BATT, R., GANT, S., LACOME, J. M., TRUCHOT, B. and TUCKER, H. CFD modelling of dispersion in neutral and stable atmospheric boundary layers: results for Prairie Grass and Thorney Island. *17th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes*, Budapest, Hungary, 9-12 May 2016, http://www.harmo.org/conferences/Proceedings/_Budapest/publishedSections/H17-059.pdf (open access)

BEERS, H. Will atypical working patterns become typical in the UK: what are the implications for occupational health and safety? *ESREL 2016 : 26th European Safety and Reliability Conferenc*e, Glasgow, UK, 25th -29th September 2016

BELL, J. and WILLIAMS, J. Consolidation of the HEART Human Reliability Assessment Priciples. *Hazards 26*, 24-26 May 2016, Paper 59, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Paper-59.pdf (open access)

CRUSE, H., MCGILLIVRAY, A., CHAPLIN, Z., COLDRICK, S., TICKLE, G., TUCKER, H. and MACBETH, R. Gas dispersion modelling using the DRIFT 3 model to assess toxic and flammable chemical major hazards. *Hazards 26*, Edinburgh, UK, 24-26 May 2016, Paper 27, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Paper-27.pdf (open access)

DAY, N. Bringing order to chaos: working in partnership to address the risks of transporting goods by road. *ESREL 2016 : 26th European Safety and Reliability Conference*, Glasgow, UK, 25th -29th September 2016,

FRASER, S., GARCIA, M., MASON, H. and WILDAY, J. COMAH 2015: practical classification of mixtures on COMAH establishments. *Hazards 26*, Edinburgh, UK, 24-26 May 2016, Paper 23, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Paper-23.pdf (open access)

GANT, S. Review of recent LNG research at HSL and possible future R&D topics. *PHMSA Pipeline Safety and Research Development Forum*, Cleveland, Ohio, USA, 16-17 November 2016 http://primis.phmsa.dot.gov/rd/mtg_111616.htm (open access)

GANT, S.E. Vapor Dispersion Model Evaluation Protocol (MEP) Update. *Pipelines and Hazardous Materials Safety Administration (PHMSA) Public Workshop on Liquefied Natural Gas (LNG) Regulations*, Washington DC, USA, 18-19 May 2016 http://primis.phmsa.dot.gov/meetings/FilGet.mtg?fil=782 (open access)

GANT, S., COLDRICK, S., TICKLE, G. and TUCKER, H. Impact of alternative dispersion model validation methods: a case study on the LNG model validation database using DRIFT. *17th International Conference on Harmonisation with Atmospheric Dispersion Modelling for Regulatory Purposes*, Budapest, Hungary, 9-12 May 2016, http://www.harmo.org/conferences/Proceedings/_Budapest/publishedSections/H17-063.pdf (open access)

GANT, S., PURSELL, M., NEWTON, A., BENNETT, D., O'SULLIVAN, L. and PIPER, D. Investigation of cargo tank vent fires on the GP3 FPSO, Part 2 : analysis of vapour dispersion. *Hazards 26*, Edinburgh, UK, 24-26 May 2016, Paper 2, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Paper-02.pdf (open access)

GANT, S., BETTIS, R., COLDRICK, S., BURRELL, G., SANTON, R., FULLAM, B., MOUSAKITIS, K., GILES, A. and BOWEN, P. Area classification of flammable mists: summary of joint-industry project findings. *Hazards 26*, Edinburgh UK, 24-26 May 2016, Paper 38, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Paper-38.pdf (open access)

GILL, J., ATKINSON, G., COWPE, E. and PAINTER, D. Vapour cloud explosions in steel clad structures. *Hazards 26*, Edinburgh, UK, 24-26 May 2016, Poster 4, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Poster-04.pdf (open access)

GOFF, R. Learning from the causes of failures of offshore riser emergency shutdown valves. *Hazards 26*, Edinburgh, UK, 24-26 May 2016, Paper 51, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Paper-51.pdf (open access)

HAWKSWORTH, S., MOODIE, K., GUMMER, J., EWAN, B., MICHELS, H., LINSTEDT, P., WINSTANLEY, P. and PEKALSKI, A. Safety of combined cycle gas turbine and gas engine systems operating on hydrogen rich syngas and biogas. *8th International Seminar on Fire & Explosion Hazards*, Hefei, China, 25-28 April 2016, http://dx.doi.org/10.20285/c.sklfs.8thISFEH.068

HEWITT, S. and BRERETON, P. Vibration emission values and risk assessment. *51st UK Conference on Human Responses to Vibration*, Institute of Naval Medicine, Gosport, UK, 14-16 Sept 2016

HOOKER, P., HODGES, J., GEARY, W. and WAKEFIELD, S. Investigation of an acetylene cylinder explosion incident. *Hazards 26*, Edinburgh UK, 24-26 May 2016, Paper

6, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Paper-06.pdf (open access)

MCKENNA, B., GARCIA, M., GANT, S., BATT, R., WARDMAN, M., TUCKER, H., TICKLE, G., WITLOX, H., FERNANDEZ, M., HARPER, M. and STENE, J. Dispersion model predictions of the Jack Rabbit II chlorine experiments using DRIFT and PHAST. *Hazards 26*, Edinburgh, UK, 24-26 May 2016, Poster 10, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Poster-10.pdf (open access)

PATEL, J. Can sander noise emission declarations be used to manage workplace noise risk? *Inter-Noise 2016,* Hamburg, Germany, 21-24 August 2016, http://ince.publisher.ingentaconnect.com/content/ince/incecp (open access)

PURSELL, M., GANT, S., NEWTON, A., BENNETT, D., O'SULLIVAN, L., HOOKER, P. and PIPER, D. Investigation of cargo tank vent fires on GP3 FPSO, Part 1: Identification of ignition mechanisms and analysis of material ejected from the flare. *Hazards 26*, Edinburgh, UK, 24-26 May 2016, Paper 1, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Paper-01.pdf (open access)

SAW, J.-L., FLAUW, Y., DEMEESTERE, M., NAUDET, V., BLANC-VANNET, P., BREUER, P., HOLLIFIELD, K. and WILDAY, J. The EU FireComp Project and risk assessment of hydrogen composite storage applications using bow-tie analysis. *Hazards 26*, Edinburgh UK, 24-26 May 2016, Paper 43, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Paper-43.pdf (open access)

TRAVERS, I., HAWKSWORTH, S. and CLAY, M. F. How to focus on the right things in complex process safety systems. *Hazards 26*, 24-27 May 2016, Paper 10, http://www.icheme.org/~/media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXVI/XXVI-Paper-10.pdf (open access)

WILLIAMS, J. and BELL, J. Consolidation of the Human Error Assessment and Reduction Technique. *ESREL 2016 : 26th European Safety and Reliability Conference,* Glasgow, UK, 25th -29th September 2016

Conference Abstracts & Posters

ATKINSON, G. Vapor Cloud Explosion (VCE) historical review. *PHMSA Public Workshop on Liquefied Natural Gas (LNG) Regulations,* Washington DC, USA, 19 May 2016

BARBER, C., WIGGANS, R. and FISHWICK, D. Mortality due to IPF and mesothelioma in Europe - a link with historic asbestos use. *European Respiratory Journal: ERS International Congress 2016 Abstracts,* 2016, 48 (Suppl 60), OA457, http://dx.doi.org/10.1183/13993003.congress-2016.OA457

BRADSHAW, L., SUMNER, J., HENNEBERGER, P. and FISHWICK, D. Characteristics of work aggravated asthma in the United Kingdom (UK). *ATS 2016: American Thoracic Society International*

Conference Abstracts, San Francisco, USA, 13-18 May 2016, A3706, http://dx.doi.org/10.1164/ajrccm-conference.2016.193.1_MeetingAbstracts.A3706

GANT, S. Review of recent LNG research at HSL and possible future R&D topics. *PHMSA Pipeline Safety and Research Development Forum,* Cleveland, Ohio, USA, 16-17 November 2016, http://primis.phmsa.dot.gov/rd/mtg_111616.htm

GANT, S., ATKINSON, G. and TUCKER, H. Dispersion behavior in severe vapor cloud explosion incidents. *20th Annual George Mason University Conference on Atmospheric Transport and Dispersion Modeling*, GMU, Fairfax, Virginia , USA, 14-16 June 2016

GANT, S. and KELSEY, A. Sensitivity and uncertainty analysis of consequence models. *FABIG Technical Meeting (TM 89)* : New Insights into Risk Assessment, London & Aberdeen, UK, 30 Nov- 1 Dec 2016

GANT, S. and STEWART, J. R. Update to the LNG dispersion model validation database. *PHMSA Public Workshop on Liquefied Natural Gas (LNG) Regulations*, Washington DC, USA, 19 May 2016

GERVAIS, R. and DAVEY, N. Assessing work-related practices and perceptions in the context of improving occupational health among quarry staff. *European Academy of Occupational Health Psychology Conference (EAOHP) 2016*, Athens, Greece, 11-13 April 2016, O46, http://www.eaohp.org/uploads/1/1/0/2/11022736/eaohp_2016_-_book_of_proceedings.pdf

HUTCHINGS, S., RUSHTON, L., SADHRA, S. and FISHWICK, D. An age-time window method to estimate a population attributable fraction for the prevalence to COPD in the UK. *Occupational and Environmental Medicine. Occupational Health: Think Globally, Act Locally, EPICOH 2016*, Barcelona, Spain, Sept 4-7 2016, http://dx.doi.org/10.1136/oemed-2016-103951.342

LOIZOU, G. An Introduction to PBPK modelling. *Toxicology Letters, 258 Supp : Abstracts of the 52nd Congress of the European Societies of Toxicology (EUROTOX)* Fibres Congress Centre, Seville, Spain 4-7th September 2016, 16 Sept 2016, S4, http://dx.doi.org/10.1016/j.toxlet.2016.06.097

MCKENNA, B., GARCIA, M., GANT, S., TUCKER, H., TICKLE, G., BATT, R., WITLOX, H. and STENE, J. Integral model predictions of chlorine dispersion for the proposed Jack Rabbit II experiments in 2016. *20th Annual George Mason University Conference on Atmospheric Transport and Dispersion Modeling*, GMU, Fairfax, Virginia, USA, 14-16 June 2016,

MOGRIDGE, R., STACEY, P. and FORDER, J. A miniature sampler for in-mask workplace measurements: safety and effectiveness. *Occupational Hygiene 2016*, Glasgow, UK, 25-28 April 2016, http://www.oh-2017.com/files/2015/08/5c_Mogridge_26Apr16_1650__2.pdf

SUMNER, J., ROBINSON, E. and FISHWICK, D. Spirometry quality control and intraindividual FEV1 and FVC variability. *ATS 2016: American Thoracic Society International Conference Abstracts*, San Francisco, USA, 13-18 May 2016, A5426, http://dx.doi.org/ajrccm-conference.2016.193.1_MeetingAbstracts.A5426

SUMNER, J., ROBINSON, E. and FISHWICK, D. Longitudinal assessment of spirometry performed for occupational health surveillance. *ATS 2016: American Thoracic Society International Conference*

Abstracts, San Francisco, USA, 13-18 May 2016, A5427, http://dx.doi.org/10.1164/ajrccm-conference.2016.193.1_MeetingAbstracts.A5427

SUMNER, J., WIGGANS, R., LEWIS, L., CODLING, A., BRADSHAW, L., ROBINSON, E., FISHWICK, D. and BARBER, C. Quality of spirometry in silica, wood and foundry workers in GB. *European Respiratory Journal: ERS International Congress 2016 Abstracts,* 2016, 48 (Suppl 60), PA3617, http://dx.doi.org/10.1183/13993003.congress-2016.PA3617

TAN, E., FISHWICK, D., PRONK, A., DROSSARD, C., LUDEKE, A., BOCHMANN, F., SCHLUNSSEN, V., HANSEN, J., SIGSGAARD, T., OSTREM, R., EDUARD, W., BUGGE, M. and WARREN, N. O29-2 The avoidable future burden of COPD due to occupational respirable crystalline silica exposure in the EU. Occupational & Environmental Medicine. *Occupational Health: Think Globally, Act Locally, EPICOH 2016,* Sept 4-7 2016, Barcelona, Spain. Oral Session 39 - Burden of Disease, 2016, 73 (1), A74-A75, http://dx.doi.org/10.1136/oemed-2016-103951.201

WIGGANS, R., ROBINSON, E., SUMNER, J., CODLING, A., LEWIS, L. and BARBER, C. S118 Can fractional exhaled nitric oxide help predict asthma in British foundry workers? *Thorax, British Thoracic Society Winter Meeting 2016*, Dec 2017, 71(Supp 3) A70, http:dx.doi.org/10.1136/thoraxjnl-2016-209333.124

WIGGANS, R., SUMNER, J., ROBINSON, E. and BARBER, C. Impact of work-related respiratory symptoms on quality of life and productivity in British woodworkers. *European Respiratory Journal : ERS International Congress 2016 Abstracts*, 2016, 48 ((Suppl 60)), PA1157, http://dx.doi.org/10.1183/13993003.congress-2016.PA1157

WIGGANS, R., SUMNER, J., ROBINSON, E. and BARBER, C. Work-related respiratory symptoms and self-reported asthma in British woodworkers. *ATS 2016 : America Thoraic Society International Conference Abstracts*, San Francisco, USA, 13-18 May 2016, A3702, http://dx.doi.org/10.1164/ajrccm-conference.2016.193.1_MeetingAbstracts.A3702

Trade and Professional

BAXTER, N. The benefits of a collaborative approach to scientific research. *Emergency Services Times Magazine*, 2016, 17 (5), 97

BEERS, H. Artificial intelligence and machine learning - what are they? Safety and Health Practitioner, 2016, http://www.shponline.co.uk/artificial-intelligence-and-machine-learning-what-are-they/

BEERS, H. Artificial intelligence: current trends and future developments. Safety and Health Practitioner, 2016, http://www.shponline.co.uk/artificial-intelligence-current-trends-and-future-developments/?cid=ema-Marketing-27%20October%202016%20-%20SHP%20Daily%20Update-CTA-

BEERS, H. Artificial Intelligence: Discussion and conclusions. *Safety and Health Practitioner,* 2016, http://www.shponline.co.uk/artificial-intelligence-discussion-and-conclusions/?cid=ema-Marketing-15%20November%202016%20-%20SHP%20Daily%20Update-CTA-

BEERS, H. Horizon Scanning: making sense of the future. *Safety and Health Practitioner,* 2016, http://www.shponline.co.uk/horizon-scanning-making-sense-of-the-future/?cid=searchresult

BEERS, H. Graphic: The future of work is changing. *Safety and Health Practitioner,* 2016, http://www.shponline.co.uk/graphic-the-future-of-work-is-changing/?cid=searchresult

BEERS, H. Infographic: what does the future of work look like? *Safety and Health Practitioner,* 2016, http://www.shponline.co.uk/infographic-what-does-the-future-of-work-look-like/?cid=searchresult

BEERS, H. Graphic: Kiss goodbye to the 9 to 5 job. *Safety and Health Practitioner,* 2016, http://www.shponline.co.uk/graphic-kiss-goodbye-to-the-9-to-5-job/?cid=searchresult

BEERS, H. Graphic: 'Gigs', not careers. *Safety and Health Practitioner,* 2016, http://www.shponline.co.uk/graphic-gigs-not-careers-may-be-future-of-work/?cid=searchresult

BEERS, H. Graphic: The future of work - the workforce is also changing.... *Safety and Health Practitioner,* 2016, http://www.shponline.co.uk/graphic-the-future-of-work-the-workforce-is-also-changing/?cid=searchresult

BEERS, H. Graphic: The changing nature of work will affect gender differently. *Safety and Health Practitioner,* 2016, http://www.shponline.co.uk/graphic-the-changing-nature-of-work-will-affect-gender-diferently/?cid=searchresult

BEERS, H. How AI could benefit the world of work and impact on OSH. *Safety and Health Practitioner,* 2016, http://www.shponline.co.uk/ai-benefit-world-work-impact-osh/?cid=homepage_1st&cid=ema-Marketing-10%20November%202016%20-%20SHP%20Daily%20Update-CTA-

BEERS, H. How will artificial intelligence impact on our jobs? *Safety and Health Practitioner*, 2016, http://www.shponline.co.uk/how-will-artificial-intelligence-impact-on-our-jobs/

BEERS, H. The influence of artificial intelligence on future skills. *Safety and Health Practitioner,* 2016, http://www.shponline.co.uk/the-influence-of-artificial-intelligence-on-future-skills/?cid=ema-Marketing-08%20November%202016%20-%20SHP%20Daily%20Update-CTA-

BEERS, H. What's enabling and hindering artificial intelligence? *Safety and Health Practitioner,* 2016, http://www.shponline.co.uk/whats-enabling-and-hindering-artificial-intelligence/?cid=ema-Marketing-02%20November%202016%20-%20SHP%20Daily%20Update-CTA

FISHWICK, D. Learn lessons from safety - it's time to focus on health. *Safety and Health Practitioner,* 2016, http://www.shponline.co.uk/46219-2/?cid=homepage_2nd

SHANKS, E. Kill noise. Don't let it be killer noise. *Emergency Services Times,* 2016, 17(1) 52,

STACEY, N. Chair's remarks. *Safety and Reliability Society Newsletter,* Jan/Feb 2016, 299 1

STACEY, N. Chair's remarks. *Safety and Reliability Society Newsletter,* March 2016, 300 1

National Statistics Publications 2016

Exposure to lead in Great Britain 2015 (published 31 March): http://www.hse.gov.uk/statistics/causdis/lead/lead.pdf

Health and Safety Statistics 2016 (published 2 November 2016) http://www.hse.gov.uk/statistics/

Mesothelioma mortality in Great Britain 1968-2014: (published 6 July 2016) http://www.hse.gov.uk/statistics/causdis/mesothelioma/index.htm

Pesticide Usage Survey -Edible outdoor crops (published October 2016) https://www.gov.uk/government/statistics/pesticide-usage-survey-report-edible-protected-crops-in-the-united-kingdom-2015

Pesticide Usage Survey - Outdoor edible crops in the UK (published October 2016) https://www.gov.uk/government/statistics/pesticide-usage-survey-outdoor-vegetable-crops-in-the-united-kingdom-2015

Statistics on fatal injuries in the workplace, Great Britain 2016: (published 6 July 2016) http://www.hse.gov.uk/statistics/fatals.htm

Violence at work 2015 (published 31 March 2016): http://www.hse.gov.uk/statistics/causinj/violence/violence-at-work.pdf

Published Interviews with HSE Scientists and Analysts

LIVERSEDGE, B 'A man with a Plan' *Safety Management British Safety Council* 2016 https://sm.britsafe.org/man-plan

SANDERSON, R. The future of health and safety: in conversation with Helen Beers, HSL. *Safety and Health Practitioner,* 14 March 2016 https://www.shponline.co.uk/the-future-of-health-and-safety-in-conversation-with-helen-beers-hsl/

Reports by HSE Scientists and Expert Committees

Annual science review 2016. HSE, 2016.

ATKINSON, G., HALL, J., McGILLIVRAY, A. Review of vapour cloud explosion incidents. U.S.Department of Transportation. Pipeline and Hazardous Materials Safety Administration, 2016. (MH/15/80)

CHAMBERS, C. Benefits of data management and data trending in the UK Continental Shelf oil and gas industry. HSE, 2016. (RR1075)

DAY, N., YEOMANS, E., NAYLOR, S. Access to and work on flatbed vehicles. HSE, 2016. (RR1079)

DAY, N., WOODY, P., NAYLOR, S. Forklift truck reverse sensor systems assessment. HSE, 2016. (RR1084)

DAY, N. The use of vehicle structure in load securing on heavy goods vehicles. HSE, 2016. (RR1078)

EVANS, G., SMITH, I. Risks to respiratory health in the grain industry. HSE, 2016. (RR1083)

FOX, D., JONES, A. Exploring the human and physical factors associated with telescopic handler overturning risks. HSE, 2016. (RR1085)

MOGRIDGE, R., BAXTER, N. Market surveillance of FFP3 disposable respirators. HSE, 2016. (RR1087)

PATEL, J. Noise risk as described in instructions supplied with printing machinery. HSE, 2016. (RR1086)

ROYAL COLLEGE OF PHYSICIANS. Every breath we take: the life-long impact of air pollution. Report of a working party. (D. Fishwick, HSE Chief Medical Adviser, is a member of this working party) RCP, 2016. ISBN 978-1-86016-567-2

SIMPSON, A., SANDYS, V., STAGG, S., POCOCK, D., HEMMINGWAY, M. Safe storage of wood pellet and wood chip fuel. HSE, 2016. (RR1077)

SNEE, T.J., BRADDOCK, R., ALLEN, J.T. Spontaneous ignition of gas turbine lubricants at temperatures below their standard auto-ignition temperatures. HSE, 2016. (RR1076)

WRAY, A.M. A study of the generic safety-integrity requirements of fairground rides. HSE, 2016. (RR1080)

ZAND, M., RUSHBROOK, C., SPENCER, I., DONALD, K., BARNES, A. Costs to Britain of work-related cancer. HSE, 2016. (RR1074)

Reports Prepared for HSE by Other Organisations

BOLT, H. Review of small wind turbine construction instructions and specifically for structural supports and foundations. HSE, 2016 (RR1081)

WEBSTER, M., BOLT, H. The effectiveness of HSE's regulatory approach: the construction example. HSE , 2016, (RR1082) h