Public Consultation: Amendments to Guidance on Technical Land-use Planning

Background to Technical Land Use Planning under the COMAH Regulations

The Seveso III Directive [2012/18/EU] requires that the objectives of preventing major accidents and limiting their consequences should be taken into account in land-use policy and this has been implemented by the COMAH Regulations 2015.

The objectives are to be achieved through controls on:

- the siting and development of new establishments
- modifications to existing establishments
- development in the vicinity of establishments.

The Health and Safety Authority (HSA) is the Central Competent Authority (CCA) for the Seveso III Directive in Ireland. Regulation 24 of the COMAH Regulations 2015 provides for the CCA to set a protective consultation distance around each establishment covered by the Directive, which must be formally communicated to all relevant planning authorities. Planning authorities, in turn, are required to seek technical advice from the CCA for proposed developments within the consultation distance. Upon receipt of an appropriate request from a planning authority relating to a proposed development, the CCA is legally obliged to provide technical land-use planning (TLUP) advice.

The published guidance on TLUP sets out the HSA's policy and practice for the provision of TLUP advice to planning authorities, as well as guidance on establishing the consultation distance. This guidance has now been in use for several years and some areas have been identified that require further clarification and updating. The major policy updates that are being proposed are outlined below, and all changes, both major and minor, are listed in Table 1.

Provision of TLUP advice

When the TLUP guidance was first published, it was intended that the planning authorities would interpret the generic advice once provided by the HSA. In practice, this is not happening, and on review of the implementation of the TLUP guidance over the last number of years, it is now proposed to align this approach with current practice. Instead, the HSA will continue to provide site-specific TLUP advice upon request from planning authorities. The document has been updated to reflect this practice.

Amended Section 1.4 Advice on new establishments and Section 1.6 Developments in the vicinity of an establishment (Sections 1.3 and 1.5 in proposed update of the guidance)

It is proposed to add new text to the TLUP guidance in sections 1.4 and 1.6 to clarify that the risk contours and criteria are based on the risk to a hypothetical member of a residential population who is always present and is indoors 90% of the time and outdoors 10% of the time.

New Section 1.7 Cumulative risk

It is proposed to add a new section on cumulative risk. This is to clarify that whilst a single development in isolation may be considered acceptable in terms of individual and societal risk, if several similar such developments were present adjacent to each other, then the overall societal risk may become unacceptable. In such instances, the new text indicates that the HSA will need to take into account specific details for the development and published methodologies, such as the 1999 UK HSE Scaled Risk Integral (SRI) approach, in its judgment of requests in certain circumstances.

Amended Section 2.3.2 Thermal effects on people inside buildings

It is proposed to provide further information regarding fireballs: they are of short duration, so people indoors are generally protected, unless the thermal radiation level is so high as to rapidly lead to the ignition of a house and its contents.

Amended Section 2.4 Explosion overpressure

The current version of the TLUP guidance states that projectile impact risks are not significant for land use planning purposes. However, this would not be correct for sites with pressure vessels such as LPG cylinder filling establishments. It is now proposed to add new text to set out the approach for projectiles associated with the instantaneous failures of a pressure vessel or a cylinder.

Amended Section 2.5.1, Table 16 Dangerous substances probits (Table 15 in proposed update of the guidance)

It is proposed to amend the probits in Table 16 to align with the recommendations of the RIVM (the Dutch National Institute of Public Health and the Environment) Toxicity Group. The scientific studies by the RIVM Toxicity Group, and subsequent publication of the latest recommended toxicity probits, are generally considered to be the most recent, robust, reliable and well-referenced analyses for toxicity probits worldwide. The recommended probit for each substance is backed up by a published document which demonstrates how the probit has been derived from the experimental data. These probits are also

consistent with consequence modelling software such as PHAST, which is widely used by COMAH operators and consultants.

Amended Section 2.7 Unbunded pool size

It is proposed that the approach for an unbunded pool fire and overtop is amended to make it simpler and more robust. The proposal is to assume that the circular overtop pool occurs in the direction of the receptor and that the wind blows in the direction of the receptor. For the purposes of generating a TLUP contour, a large grid of thousands of receptors is used, with individual risk calculated for each. The risk contour illustrates the culmination of these results.

Amended Section 2.9 Jet fires

It is proposed to add new text to clarify the approach to be taken for horizontal jet fires rather than vertical jet fires. This is a more robust approach as the hazard ranges for a vertical jet fire may be very low compared to horizontal jet fires, particularly for smaller jet fires.

New section 2.12 Flash fire

It is proposed to add a new section on flash fires and modelling of same.

Amended Section 3 Loss of containment events

The current publication includes a ’10 mm pipe leak over 30 minutes’ as a loss of containment scenario for multiple events, full details set out in Table 1. It is proposed to change this approach to consider a leak based on a hole equal to the largest connection to the vessel, which is more likely to occur than a 10 mm pipe leak and is consistent with best practice in land use planning.

Amended Section 3.6 Flammable liquid storage installations

It is proposed to amend the text in Section 3.6 to provide clarity regarding Buncefield-type vapour cloud explosion events. Such events can be the dominant risk for large-scale petroleum sites, particularly at medium to large distances from the site. Thus, additional text has been added to Section 3.6.1 to clarify the approach for a Buncefield-type event associated with the loss of containment of a flammable liquid resulting in a vapour cloud explosion. The update includes the frequency of such an event and the parameters that need to be considered in relation to the associated consequences.

Sections 3.6.1 to 3.6.4 have been amended to take account of the updates to Section 2.7.

Amended Section 3.9.1.2 (Section 3.9.2 in proposed update of the guidance)

It is proposed to add new text to set out the approach to be taken when modelling loss of containment scenarios for gas turbine enclosures associated with power-generating plants.

Table 1: List of proposed changes in guidance on technical land-use planning advice

Change #	Part in the current version	Details of the amendment	Justification for the amendment
GENERAL AMENDMENTS			
1.		General updates throughout the document: • Minor updates to text • Minor amendments to the glossary of terms and definitions • Removed all references to the 'Policy & Approach of the Health & Safety Authority to COMAH Risk-Based Land-Use Planning (19 March 2010) • Replaced Central Competent Authority (CCA) with HSA • Removed 'generic' in relation to technical land-use planning advice • Updated section numbering in Part 1 to take account of the error in the current version and the insertion of new Section 1.7 • Updated figure numbers to take account of the deletion of Figure 4 in Part 1 • Updated table numbers to take account of the deletion of Table 7 in Part 1 • Updated section numbering in Part 2 to take account of the insertion of new Section 2.12 • Updated appendix numbers to take account of the deletion of some appendices • Updated references	To improve clarity and align with current practice
EXECUTIVE SUMMARY			

2.	Executive Summary	Updated text	To reflect changes throughout the document
NON-TECHNICAL SUMMARY			
3.	Non-Technical Summary	Removed reference to Appendix 4 and updated text	To reflect deletion of Appendix 4 (see change # 65 below) and reflect changes throughout the document
PART 1			
4.		Amended numbering of sections	To correct error in current version (there was no section 1.1)
5.	1.2 (1.1 in updated version)	Removed reference to Appendix 1	To align with current practice. Planning bodies changed their referral system to a portal system thus removing the need for the form in Appendix 1.
6.	1.2, 1.3, 1.4, 1.5, 1.8 & 1.10 (1.1, 1.2, 1.3, 1.4, 1.8 & 1.10 in updated version)	Minor updates to text	To improve clarity
7.	1.4 & 1.6 (1.3 & 1.5 in	Added new text to both sections setting out the basis of risk contours and criteria, and the rationale for this approach	To improve clarity and ensure a consistent approach

	updated version)		
8.	1.6 (1.5 in updated version)	Removed 'generic' from the heading	To improve clarity
9.	1.6 (1.5 in updated version)	Removed Figure 4	To align with deletion of Appendix 4 (see below)
10.	1.7 (1.6 in updated version)	Amended Figure 5 (Figure 4 in updated version) to show vertical axis as 'Frequency in cpm (F)' and horizontal axis as 'Number of fatalities' (N)	To improve clarity
11.	1.7 in updated version	Added new section on cumulative risk	To improve clarity
12.	1.8	Added new text	To improve clarity on the use of CDOIF* assessments by operators *Chemical and Downstream Oil Industries Forum
13.	1.8	Removed Table 7	Table shows historic data that does not need to be included at this stage
14.	1.8	Added new text at the end of this section	To improve clarity on the approach to be taken for external events such as high winds, floods and earthquake

15.	1.9	• Removed reference to HSA's previous position paper setting the specified area 2003 • Minor updates to text	• Paper is no longer relevant • To improve clarity
16.	1.11	Amended text regarding use of a change log	To explain that changes to the document will be captured as part of the consultation process rather than in a change log document
PART 2			
17.	2.2, Table 8 (Table 7 in updated version)	Changed probit for chlorine toxicity	To reflect the correct latest (2018) probit from RIVM – see page 8 of https://www.rivm.nl/sites/default/files/2018-11/20180315%20Chlorine-interim.pdf. This has been converted to ppm (which changes the 'a' value. This was also recently implemented in consequence modelling software PHAST 9.1.
18.	2.3.2	Added new reference: https://www.hse.gov.uk/comah/assets/docs/methane-gas-holders.pdf; Building Regulations of 2006 Technical Guidance Document B on Building Fire Safety	The reference previously quoted has been replaced with the new reference across
19.	2.3.2	Added a new sentence at the end of this section	To provide further information regarding fireballs i.e. they are of short duration, so people indoors are generally protected unless the thermal radiation level is so high as to rapidly lead to ignition of house and contents.
20.	2.3.3	Updated reference at footnote 17 (footnote 15 in updated version)	

21.	2.4	Added new text at the end of this section to set out the approach for projectiles associated with the instantaneous failures of a pressure vessel or a cylinder.	To explain that the information is needed for land-use planning zones for sites with many gas cylinders and may be relevant for the consultation distance for sites with large pressure vessels.
22.	2.4.1	Removed the last paragraph on projectiles and replaced it with the new text in section 2.4 above	To align it with the new text added above in section 2.4
23.	2.4.2	Added new text at the end of this section	To emphasise that when calculating LUP zones (or for comparison with risk criteria), CIA Category 3 should be used. Other vulnerability relationships can be used when calculating actual individual or societal risks.
24.	2.4.2	Deleted sentence above Figure 6 (Figure 5 in updated version)	To provide consistency with the new text added to this section.
25.	2.5.1, Table 16	Added new text before Table 16 (Table 15 in updated version)	To update Probits
26.	2.5.1, Table 16	Amended probits in Table 16 (Table 15 in updated version) to align with the updated probits published by RIVM	The scientific studies by the RIVM Toxicity Group, and subsequent publication of the latest recommended toxicity probits, are generally considered to be the most recent, robust, reliable and well-referenced analyses for toxicity probits worldwide. The recommended probit for each substance is backed up by a published document which demonstrates how the probit has been derived from the experimental data. These probits are also consistent with consequence modelling software such as

			PHAST, which is widely used by COMAH operators and consultants. Note: the updated probits provided by RIVM on their website are in units of mg/m^3, whereas some software (including PHAST) requires the probit data in units of ppm. The updated probits in the proposed TLUP have been converted to ppm for convenience and to avoid potential conversion errors.
27.	2.5.6	Deleted text at the end of this section	It is not necessary to allocate the probability over eight sectors
28.	2.7	Amended the section to include the deletion of some of the existing text and the insertion of new text	To simplify the approach, the proposal is to assume that the circular overtop pool occurs in the direction of the receptor and that the wind blows in the direction of the receptor. For the purposes of generating a TLUP contour, a large grid of thousands of receptors is used, with individual risk calculated for each. The risk contour illustrates the culmination of these results.
29.	2.8	Updated Table 18 (Table 17 in updated version) and included a new reference	To include pentane as a substance and a reference for surface emissive power (SEP) values
30.	2.9	Amended the section to include the deletion of some of existing text and the insertion of new text	To provide clarity on the approach to be taken regarding horizontal jet fires, rather than vertical jet fires. This is a more robust approach, as the hazard ranges for a vertical jet fire may be very low, particularly for smaller jet fires.

			Note: it is conservatively assumed that releases are directed downwind (which gives the maximum range), and that jet fires are equally likely to occur in any direction (as the jet direction depends on the release orientation).
31.	2.10	Amended Figure 7 (Figure 6 in updated version)	To include the entire version of this Figure (the current version has an extracted version of the Figure).
32.	2.11	Changed title of section to 'BLEVEs/Fireballs'	To improve clarity
33.	2.12	Added a new section on 'Flash fires'	For consistency throughout the document
PART 3			
34.	3, Tables 23, 28, 29, 44, 46, 48 & 70	• Changed loss of containment scenario '10 mm leak over 30 minutes' to 'largest connection leak over 30 minutes' • Changed the frequency of this event in Tables 23, 28 and 29 from 1 x 10^{-5} to 1 x $10^{-4,}$ resulting in an increase by a factor of 10 in the consequence frequencies for a jet fire, VCE and flash fire (Tables 22, 27, 28, 43, 45, 46 & 69 in updated version)	Changing approach so that a leak based on a hole equal to the largest connection to the vessel is considered and at a higher frequency (Tables 23, 28 and 29). The current approach does not consider the risks from all the pipework, pumps and equipment associated with the storage, so the proposal is to amend to a more conservative approach which bounds all the smaller releases. This approach is only for larger tanks, and the 10mm pipe leak has remained for smaller vessels such as stills and process vessels.
35.	3.1.2, Table 25 3.2.2, Table 32	Amended text regarding reference to 'diameter' in loss of containment scenarios to read '10% of the diameter'	For consistency throughout the document

	3.4.2, Table 39 3.5.1, Tables 40 & 41 3.6.5, Table 52 3.9.1, Table 62 3.13.1, Table 73	(Tables 24, 31, 38, 39, 40, 51, 61 & 72 in updated version)	
36.	3.1.2	Added sentence to description for Table 25 (Table 24 in updated version)	To improve clarity regarding loss of containment scenarios
37.	3.2.1	Deleted sentence after Table 29 (Table 28 in updated version)	To improve clarity
38.	3.2.2	Amended text in Table 31 (Table 30 in updated version) by replacing 'fireball' with 'jet fire' in row of table relating to 'continuous leak over 10 minutes'	To improve clarity
39.	3.3	Amended text to differentiate between flammable gas in the digester and upgraded biogas filled into pressure vessels	To align with Note 19 in Schedule 1 of the COMAH Regulations (S.I. 209 of 2015)
40.	3.3.1, Table 34	Amended title of Table 34 (Table 33 in updated version) to read 'Scenarios for flammable gas in digesters'	To improve clarity
41.	3.3.1, Table 35	• Changed title of Table 35 (Table 34 in updated version) to read 'Scenarios for pressurised vessels of upgraded biogas'	To improve clarity

		• Amended loss of containment scenario 'release through 10 mm pipe' to read 'release through 10 mm pipe leak over 30 minutes'	
42.	3.4	Changed 'barg' to 'bar'	For consistency throughout the document
43.	3.5.1, Table 42 & 3.10, Table 67	Amended the conditional probability for flash fire to 0.54 (Tables 41 & 66 in updated version)	To correct the error in the current version
44.	3.5.1, Table 41 & 3.10, Table 67	Amended the conditional probability for VCE to 0.36 (Tables 40 & 66 in updated version)	To correct the error in the current version
45.	3.6	Changed 'H phrases' to 'H statements'	To bring it in line with the terminology of CLP
46.	3.6.1	Amended 2nd paragraph to include the deletion of existing text and the insertion of new text	To provide clarity regarding Buncefield-type vapour cloud explosion events. Such events can be the dominant risk for large-scale petroleum sites, particularly at medium to large distances from the site. Thus, additional text has been added to Section 3.6.1 to describe a Buncefield-type event associated with the loss of containment of a flammable liquid resulting in a vapour cloud explosion. The update includes the frequency of such an event and the parameters that need to be considered in relation to the associated consequences. Sections 3.6.1 to 3.6.4 have been amended to take account of the updates to Section 2.7.

47.	3.6.1, 3.6.2, 3.6.3 & 3.6.4	Amended text	To reference updates to Section 2.7
48.	3.6.2	Amended text in 1st paragraph	To align with the new text in section 3.6.1
49.	3.6.6	Deleted sentence regarding full containment of atmospheric storage tanks	To align with frequencies in Table 54 (Table 53 in updated version)
50.	3.6.6	Amended the consequence for event # 156 to read 'Continuous release from a hole with an effective diameter of the largest connection into the intact outer shell'	Changing the approach so that a leak based on a hole equal to the largest connection to the storage tank is considered. This is a conservative approach and is consistent with the approach taken in the Netherlands and the UK.
51.	3.6.7	Deleted sentence on consultation of the applicant with operator in relation to major accidents removed	To align with current practice
52.	3.7.1	Deleted last sentence regarding 1% fatality	The sentence is not relevant
53.	3.7.2	Amended scenario in Table 55 (Table 54 in updated version): 'Fire truck in stack' – '30 t detonation' changed to '30 t explosion'	For consistency throughout the document
54.	3.8	Minor amends to text	To improve clarity
55.	3.8	Amended scenario in Table 59 (Table 58 in updated version): 'Fire (100% of inventory)', frequency changed from '5×10^{-4}' to '5×10^{-5}'	To correct the error in the current version

56.	3.9.1	Deleted heading '3.9.1 Approach' and replaced with 3.9.1 Risks from atmospheric bulk storage of toxic (and water-reactive) liquids	Heading is not required and does not have associated text. Renumbered 3.9.1.1 as 3.9.1
57.	3.9.1.2	This section is retitled as 3.9.2 New text added to set out the approach to be taken when modelling loss of containment scenarios for gas turbine enclosures associated with power-generating plants.	Renumbered following the amendment to 3.9.1.1 To improve clarity when completing loss of containment modelling for power stations
58.	3.9.1.2	Amended scenario in Table 64 (Table 63 in updated version): 'Release through 10 mm pipe' changed to 'Release through 10 mm pipe leak'	To improve clarity
59.	3.10	• Minor amends to text • Added a sentence at the end of the section referencing Section 2.4 • Amended scenarios in Tables 65 and 66 (Tables 64 & 65 in updated version): 'D=3.3 mm)' changed to 'Diameter = 3.3 mm'	To improve clarity
60.	3.11.1	Deleted reference to ESTC model	To align with current practice
REFERENCES			
61.	Amended and updated references as required		
APPENDICES			
62.	1	Removed Appendix 1	See justification at change #5
63.	2	Renumbered as Appendix 1 and updated 'Development Sensitivity Levels' to include:	To reflect our review of the updates to the UK's Land-Use Planning Methodology

		• Amendment to DT1.1 (Workplaces) to include self-storage units • Amendment to D2.3 (transport links) to include cycle paths, bridle paths and footpaths • Amendment to DT2.5 (Development for outdoor use by the public) to include landscaped and other low-density outdoor areas	(previously referred to as the UK HSE PADHI document)
64.	3	Removed Appendix 3	Deemed unnecessary as it summarised information in new Appendix 1 above
65.	4	Removed Appendix 4	No longer relevant due to the proposed change in policy resulting in planning bodies not being required to interpret generic advice (see note in non-technical summary above)
66.	5	Renumbered as Appendix 2	