Land Use Planning in the context of Industrial Accidents

European Situation and Austrian Approach

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Ljubljana, 14th March 2019

Introduction

- Born 1954 in Vienna
- Academic Career: 1982 Graduated Technical Engineering, 2002 PhD Land-Use Planning, 2014 MSc Environmental Sciences
- Professional Career:

❖ 1982 – 1988 Vienna City Authority

❖ 1988 – now Federal Economic Ministry Austria

❖ 2003 – 2006 European Commission, Major Accident Hazards Bureau

❖ Since 2012 Head of Division for Industrial Technologies

- Future Plans: Explore the field of safety performance indicators

Basics

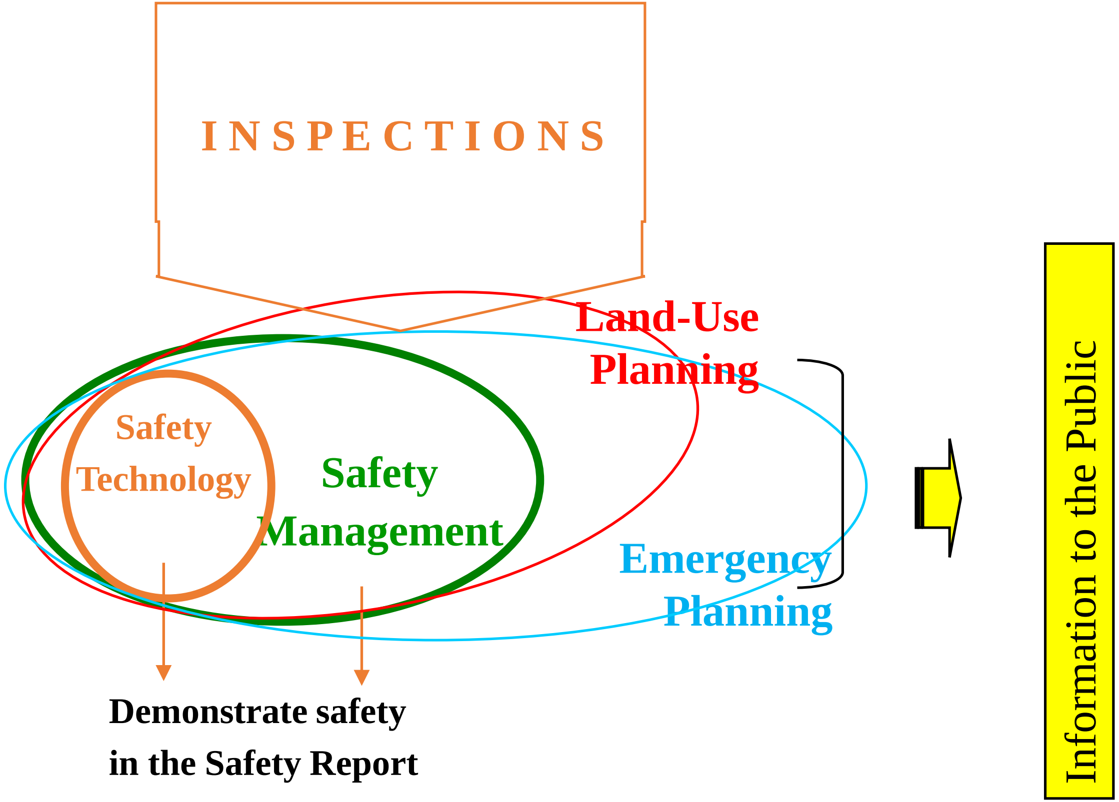
- Plan: a description of a desired situation in the future (bad interpretation: planning replaces coincidence by error)
- Role of a „plan“:

❖ strong: (legally) binding, directly or by court

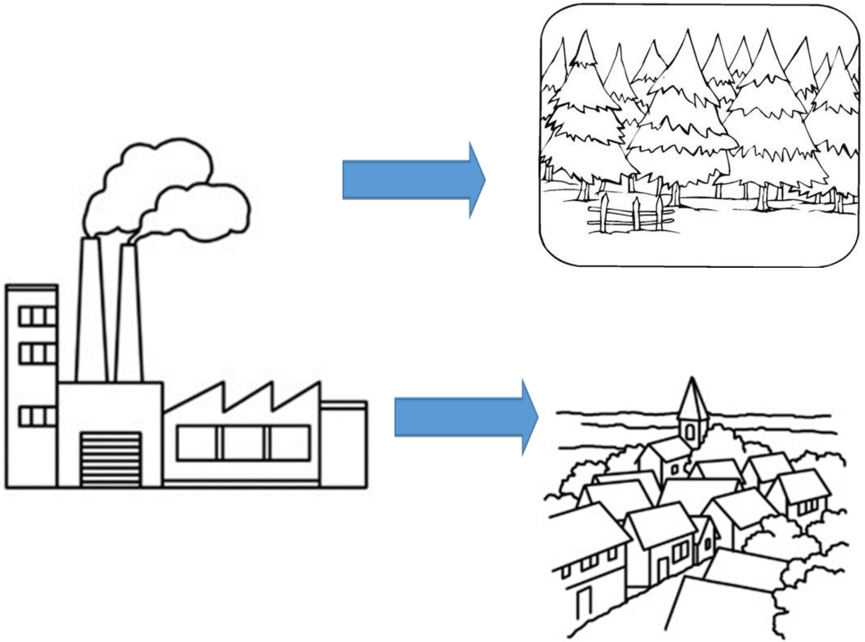
❖ weak: non – binding decision factor (guidance aid)

- Land-Use (or „Spatial“) Planning: allocation of rights and/or restrictions
- Land-Use Planning is a multi-issue task with considerable political implications
- One outcome of a land-use planning process: the zoning (separation of uses)

Philosophy of Seveso II - III



Philosophy of Seveso II - III



Industrial accidents

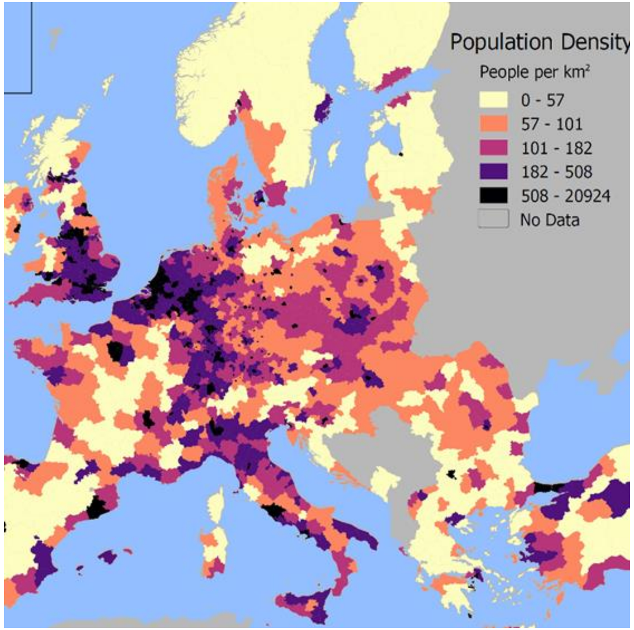
- might happen with
  low frequency/high consequence
- might have impacts on natural
  environment and built-up areas

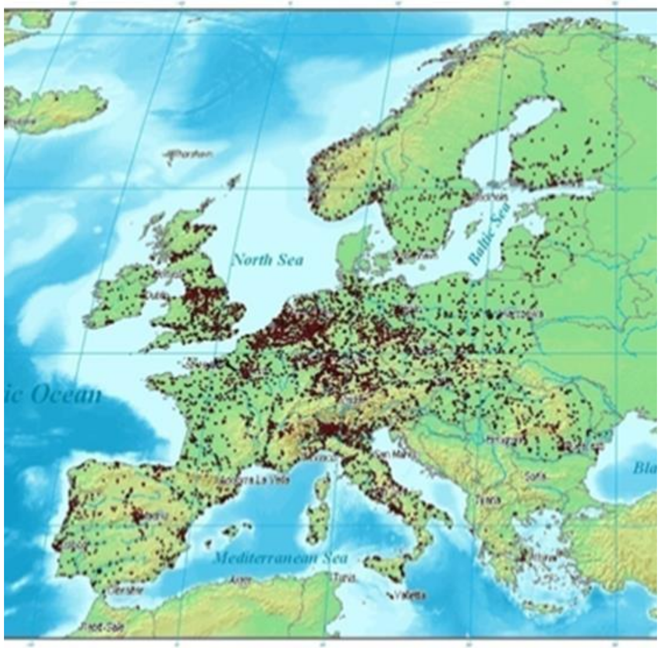
❖ There is no zero-risk (no complete prevention by technical or organizational measures)

❖ Land-use planning is a tool to reduce (not to eliminate) consequences

❖ There is an elastic „consequence – reduction“ - triangle (land-use planning, safety measures on-site, emergency response off-site)

Main Challenge





Related Legislation

- UNECE Industrial Accidents Convention
- SEA 2003 Protocol
- Espoo Convention
- Aarhus Convention
- EIA - Directive 2011/92/EU (amended by 2014/52/EU)
- SEA – Directive 2001/42/EC
- Env. Information – Directive 2003/4/EC
- Critical Infrastructure – Directive 2008/114/EC

History

- 1980s: Some countries establish safety concerns in land-use planning (LUP)
- 1984: Bhopal and Mexico City accidents
- 1991: First consideration of safety issues for LUP on a multinational scale (seen as a mandate for EU legislation)
- 1996: Seveso II Directive Article 12 requires that member states‘ LUP policy should take into account
- the prevention of major accidents and the limitation of the consequences,
- the need to establish and maintain appropriate distances between Seveso establishments and residential or sensitive areas and
- in case of existing establishments the option of additional technical measures

History

- 1996 – 1999: 1st Technical Working Group of EU Commission (MAHB)
- 1999: 1st Guidance (mainly descriptive)
- 2001: Accidents in Toulouse and Enschede, Lille Conference 2002 → LUP as relevant factor, differences in EU-wide approaches
- 2002: Re-establishing of LUP – Working Group
- 2003: Amended Seveso Directive with mandate to establish „database“
- 2006: 2nd Guidance (contains common agreed principles), no agreement on underlying documents (database, endpoints)
- 2008: Re – start of Working Group
- 2012: Article 13 in Seveso III without database mandate

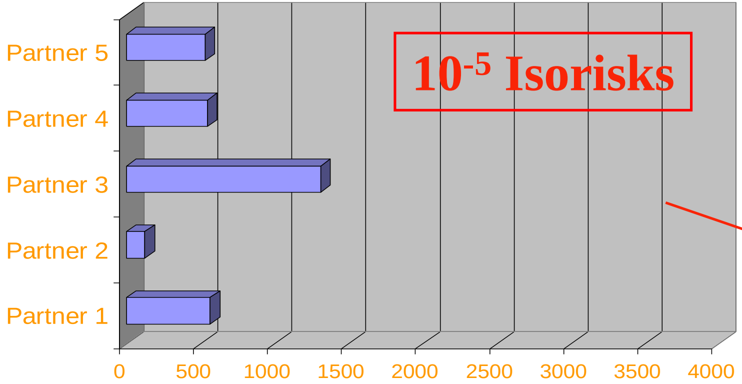
History

- From the beginning in 1997 there was great uncertainty how to implement the Seveso-LUP requirement
- Reasons:
  - Different LUP approaches as such
  - Different risk assessment methods
  - Different established criteria
  - „Risk“ is a factor that cannot be directly measured (in contrast to noise or air quality)

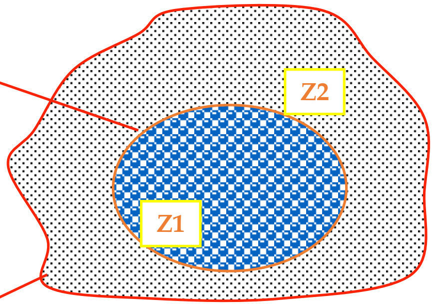
→ Big differences in understanding and implementation

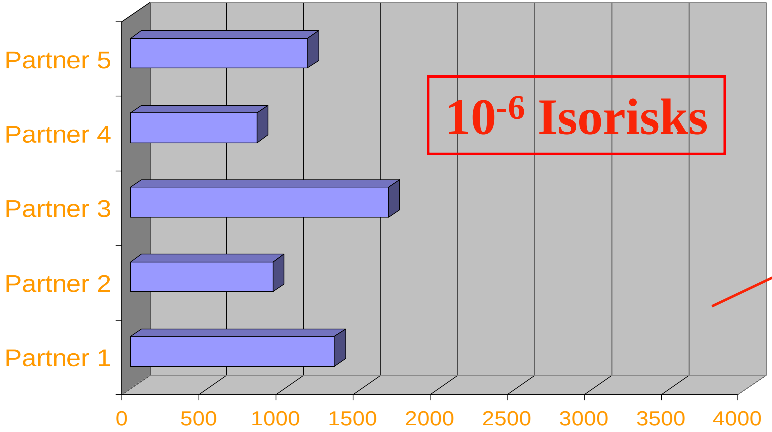
Results of case studies by WG

Slide shown at Ljubljana seminar in 2005



Average = 615 m
Variation = -80% … +113%

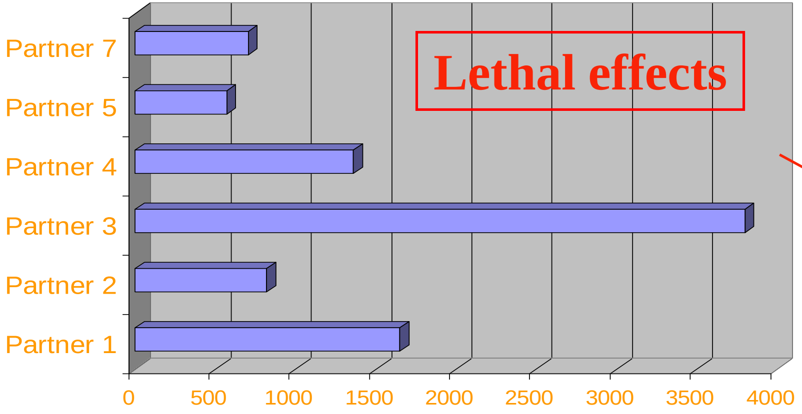




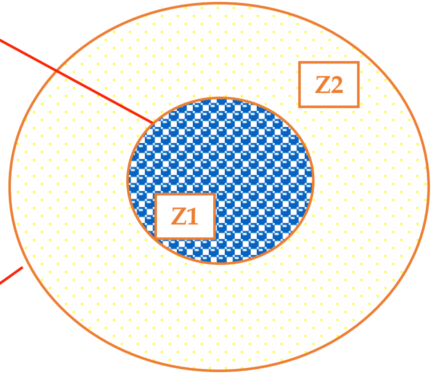
Average = 1180 m
Variation = -30% … +42%

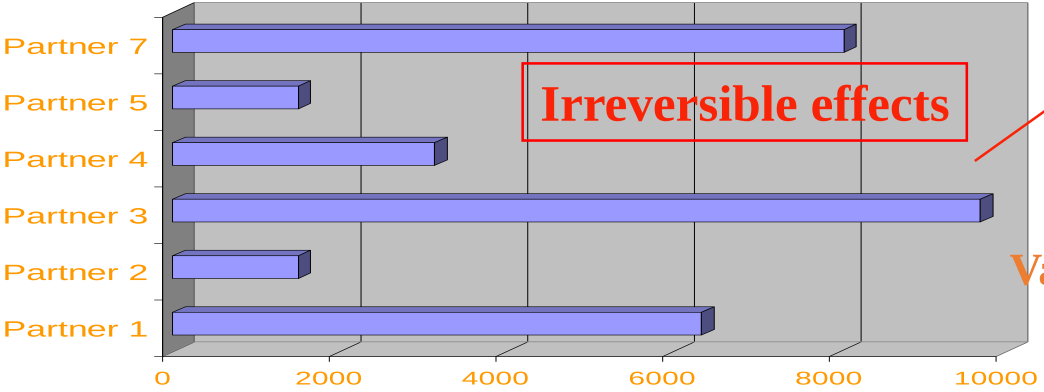
Results of Case Studies by WG

Slide shown at Ljubljana seminar in 2005



Average = 1484 m
Variation = -61% … +156%



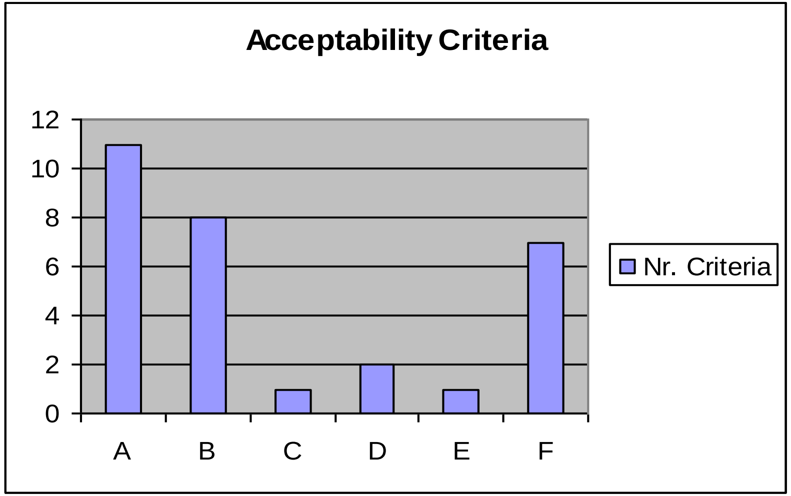


Average = 5047 m
Variation = -70% … +91%

Slide shown at Ljubljana seminar in 2005

Use of Different Approaches

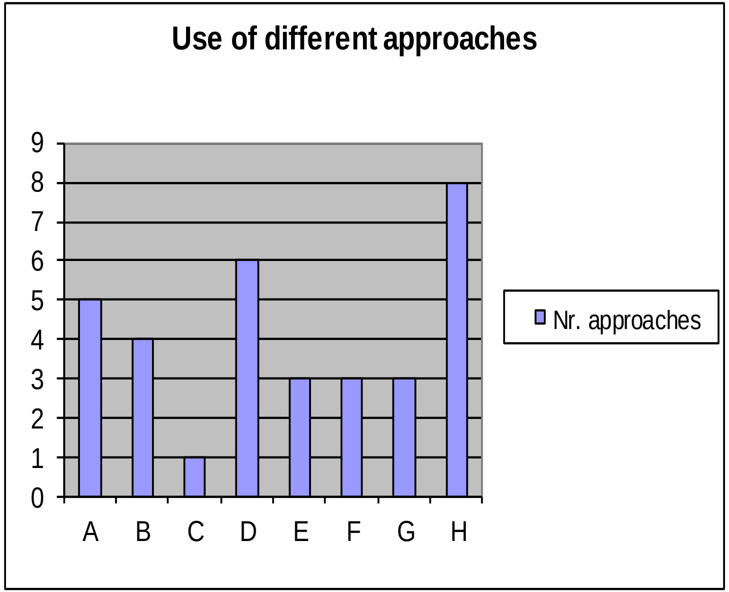
- A: Individual/Group Risk
- B: Acute (short term) Fatalities
- C: Total Nr. Fatalities
- D: Nr. Fatalities + Injuries
- E: Injuries of large nr. of people
- F: Material Damage



Slide shown at Ljubljana seminar in 2005

Use of Different Approaches

- A: Full probabilistic
- B: Probabilistic with conventions
- C: Consequence – worst case
- D: Consequence – representative case
- E: Semi-quantitative
- F: Generic – pre-selected scenarios
- G: Generic – not calculated
- H: Case-by-case



Assistance Efforts

- JRC - LUP Working Group (1996 – 2017, with interruptions)
- ARIPAR – project, later transformed to ADAM (Accident Damage Analysis Module, starting ca. 1998, completed 2018)
- ARAMIS – project (Accidental Risk Assessment Methodology for IndustrieS; 2002 – 2005)
- RHAD (Risk/Hazard Assessment Database, 2003 – 2006)
- ACUTEX/AETL (Acute Exposure Threshold Levels; 2002 – 2006)

General Guidance Documents

- 1999: Guidance on Land Use Planning as Required by Council Directive 96/82/EC (Seveso II) by M. D. Christou and Sam Porter – brief description of some practices and approaches
- 2006: Land use planning guidelines in the context of article 12 of the Seveso II directive 96/82/EC as amended by directive 105/2003/EC, also defining a technical database with risk data and risk scenarios by M. D. Christou, M. Struckl and T. Bierman – contains some principles and explanations and seeks to define a database concept
- 2008: Implementing Art.12 of the Seveso II Directive: Overview of Roadmaps for Land-Use Planning in selected Member States by Claudia Basta, Michael Struckl and Michalis Christou – more detailed description of some approaches including an introduction with policy-related statements on LUP
- 2017: Handbook of scenarios for assessing major chemical accident risks by Zsuzsanna Gyenes, Maureen Wood and Michael Struckl

Typical Seveso/LUP - Approaches

- „Deterministic generic format“: Pre-defined distances based on pre-defined scenarios with pre-defined consequence assessment (quantitative or qualitative) → generic zoning
- „Deterministic individual format“: Individual site-specific scenarios (no assessment of likelihood, based on generic hazards) with quantitative consequence assessment, distinction between effects and comparison with harm values (lethal, irreversible) → individual zoning based on effects
- „Risk-based Format“: Calculation or pre-defined assumption of scenario event likelihood, quantitative assessment of consequences and related risk, comparison with risk figures → individual zoning based on risk figures
- Many forms of mixtures (semi-quantitative, hybrid etc.)

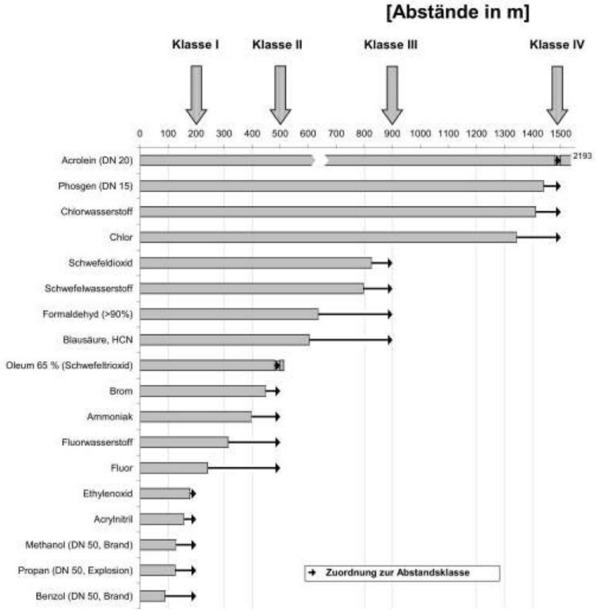
„Undisputed“ Principles

- Existing situations do not need action if there is no triggering factor (eg. substance increase etc.) – sometimes called „legacy of the past“
- Certain land-use types around a Seveso site are allowed (mainly industrial/commercial)
- There is a need for the assessment of the significance of a risk increase (not necessarily quantitative)
- A distinction between „old“ and „new“ sites is justified (eg. for additional measures)
- New substance classification does not mean a new site (but may cause LUP problems)
- No use of absolute „worst case“ scenarios for decisions
- Define LUP restrictions by zoning
- The Seveso LUP decision shall be political one based on technical advise

Divergencies

- Different LUP decision levels (SEA, local land-use, individual building permit) with different requirements and time frames
- LUP decision may have a connection to a safety report or not (separate generic assumptions; safety report may not be available at time of LUP decision)
- Big variation in „endpoint“ assumptions (effect values, risk acceptance criteria) and failure frequencies for event likelihood calculation
- Different role of the precautionary principle
- Different understanding of the technical „State-of-the-Art“

German Approach



<u>3 – step – model:</u>

1.) If „protected use" is outside of the generic distances to the left, no further needs (assumptions for the table 25 mm leakage, ERPG-2, 0,1 bar, 1,6 kW/m^2)

2.) If table distance is not achieved, „site-specific" distance is calculated

3.) If this specific distance is still not achieved, there is a specific permit procedure separate and in addition to other permits with extra on-site measures

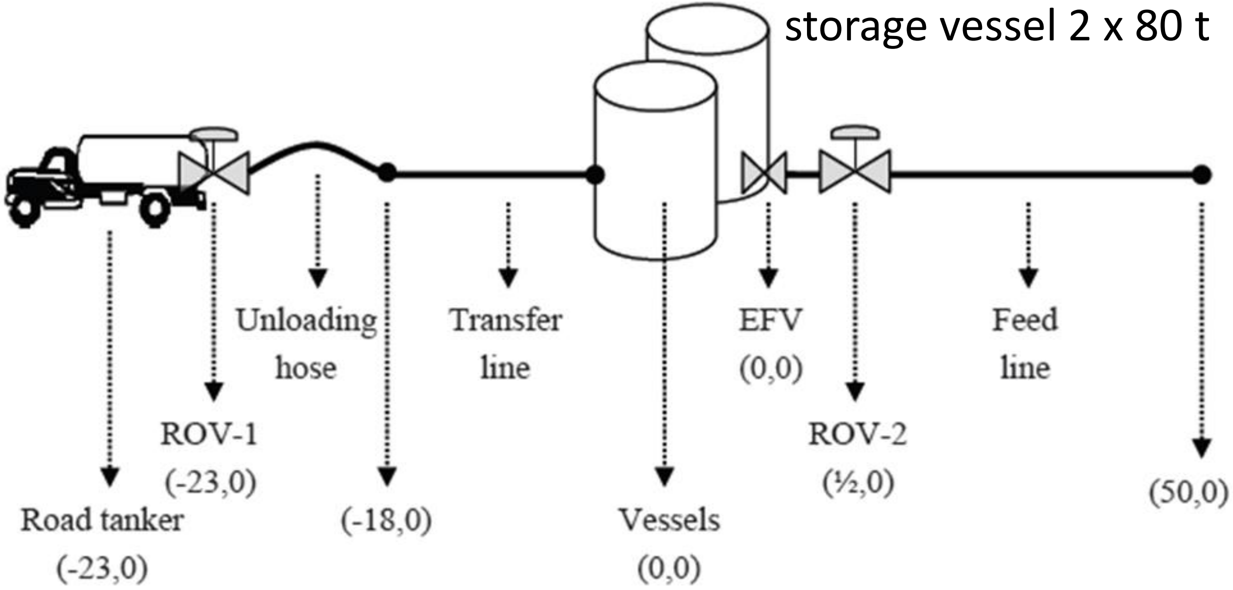
European Court

- European Court Judgement of 15 September 2011 („Mücksch“ – case C 53/10)
- Intended garden center near a chemical factory in Darmstadt
- Summary of the judgement:

❖ All national administration bodies have to consider the LUP article if assigned respectively

❖ The LUP article does not mean to forbid „sensible“ use absolutely but it requires a proper risk assessment

Chlorine LUP Case Study
(for the „LUP Handbook“)

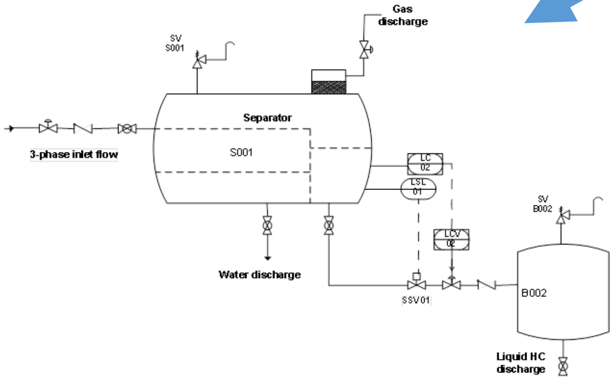


Chlorine LUP Case Study

Participating Team	[I] 200 m	[H] 300 m	[G] 400 m	[F] 500 m	[E] 600 m	[D] 700 m	[C] 800 m	[B] 900 m	[A] School 1000 m	[J] Office 200 m	[K] Office 800 m
P1	NO	NO	YES	YES	YES	YES	YES	YES	YES	NO	YES
P2	NO	NO	YES	YES	YES	YES	YES	YES	NO	NO	NO
P3	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO	YES
P4	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES
P5	NO	NO	NO	NO	YES	YES	YES	YES	NO	YES	YES
P6	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	NO
P7	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO
P8	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Risk Assessment

- LUP/Seveso decision requires some form of risk assessment either
  – before defining a generic scenario or
  – for an individual process based on a safety report
- Such a risk assessment comprises a number of components derived either
  – by convention or
  – by pragmatic decision or
  – by scientific basis
- The more non-pragmatic and non-conventional components are required, the longer and the more complicated is the process

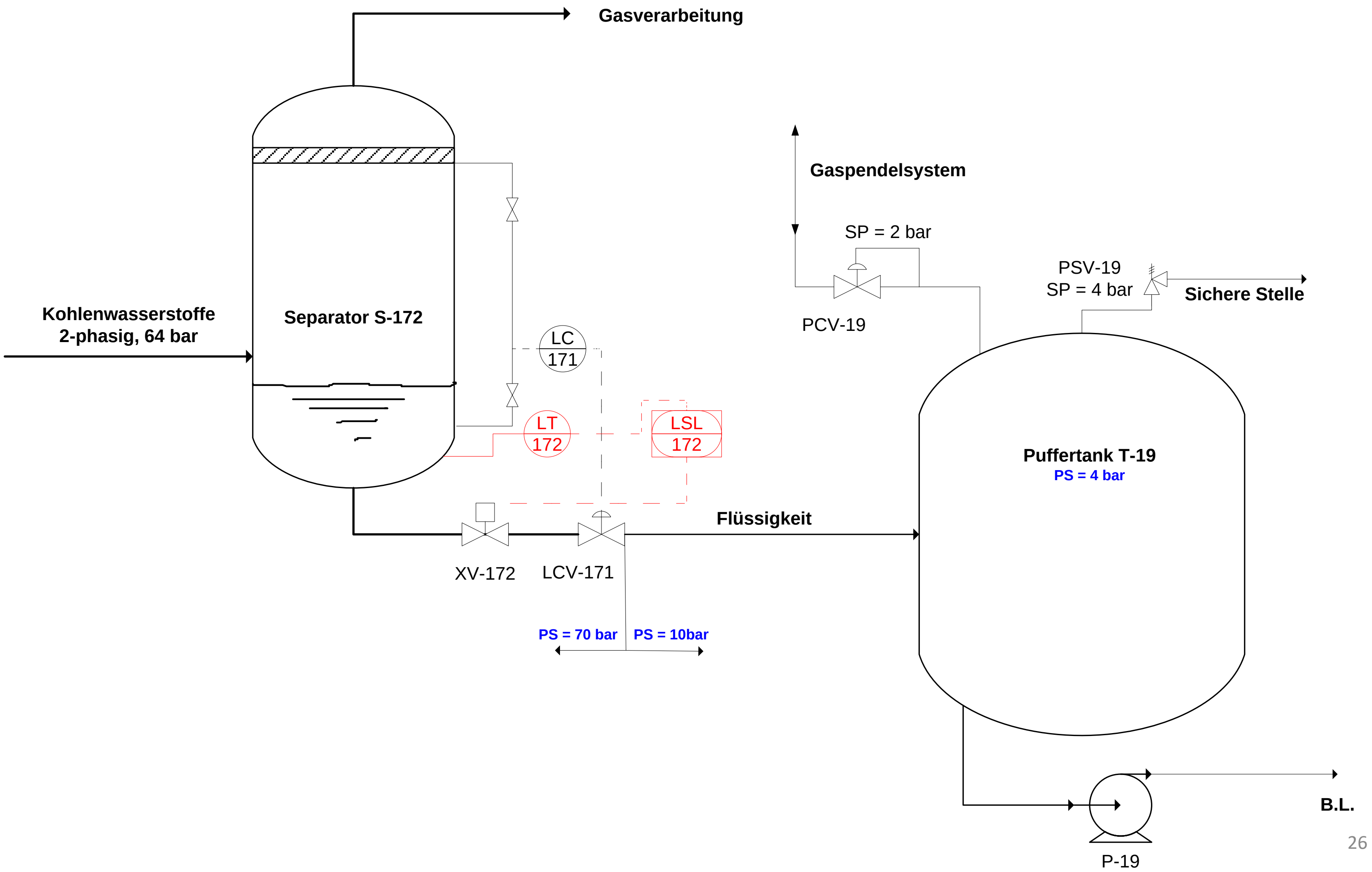


Scenario Description	Three scenarois (having different initiating events) which will lead to uncontrolled pressure and temperature raise are considered. Uncontrolled pressure and temperature raise result in bursting of the reactor and in harm to personnel due to the pressure wave and flying debris. **Case (1)**: Malfunction of the control loop TC02 blocks cooling media flow. **Case (2)**: Failure of cooling fluid supply (not shown in the scheme). **Case (3)**: Malfunction of the control loop FC01 results in overdosing material 2. The corresponding heat of reaction cannot be dissipated (by maximum cooling fluid flow).
Note	In practice, failure of the stirrer device has to be considered separately if this failure results in an uncontrolled reaction too.

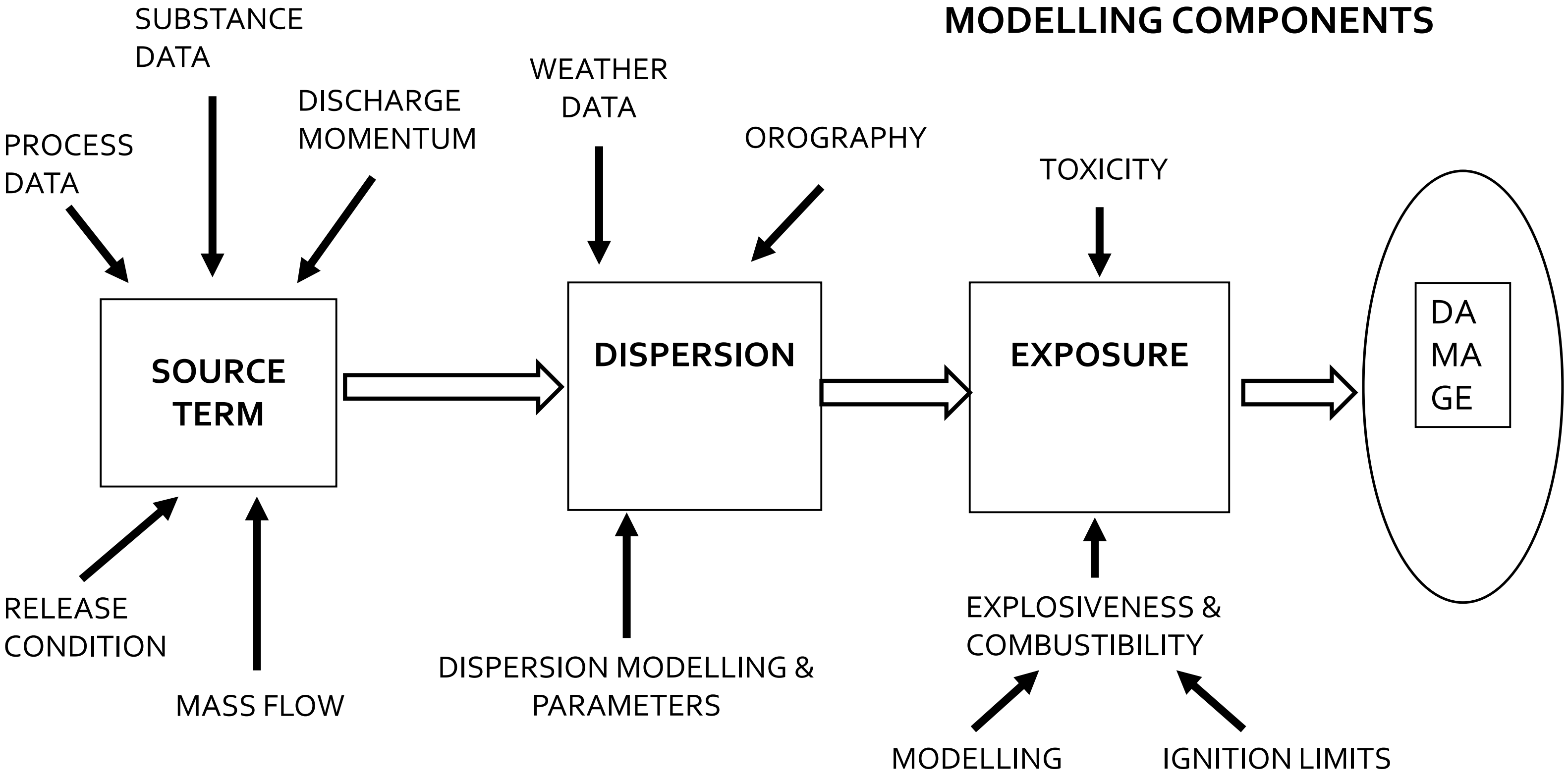
Initiating Event	**Description**	**Frequency**
	Case 1: Malfunction of control loop TC02 (BPCS)	0.1 cases/year
	Case 2: Failure of cooling fluid supply (frequency is assumed to be evaluated plant specifically).	0.2 cases/year
	Case 3: Malfunction of control loop FC01 (BPCS)	0.1 cases/year

Enabling Condition	**Description**	**Probability**
	Not appllicable	-

Consequence	**Type**	**Description**	**Level**
	Case 1, 2, 3		
	Persons (P)	Serious permanent injury to one or more persons; one fatality (workforce).	C2
	Environment (E)	No serious consequences	-
Note	Release of the reaction materials does not result in harm to the environment.		


Gasverarbeitung
Gaspendelsystem
SP = 2 bar
PSV-19
SP = 4 bar
Sichere Stelle
PCV-19
Kohlenwasserstoffe
2-phasig, 64 bar
Separator S-172
LC
171
LT
172
LSL
172
Puffertank T-19
PS = 4 bar
Flüssigkeit
XV-172
LCV-171
PS = 70 bar
PS = 10bar
B.L.
P-19

MODELLING COMPONENTS

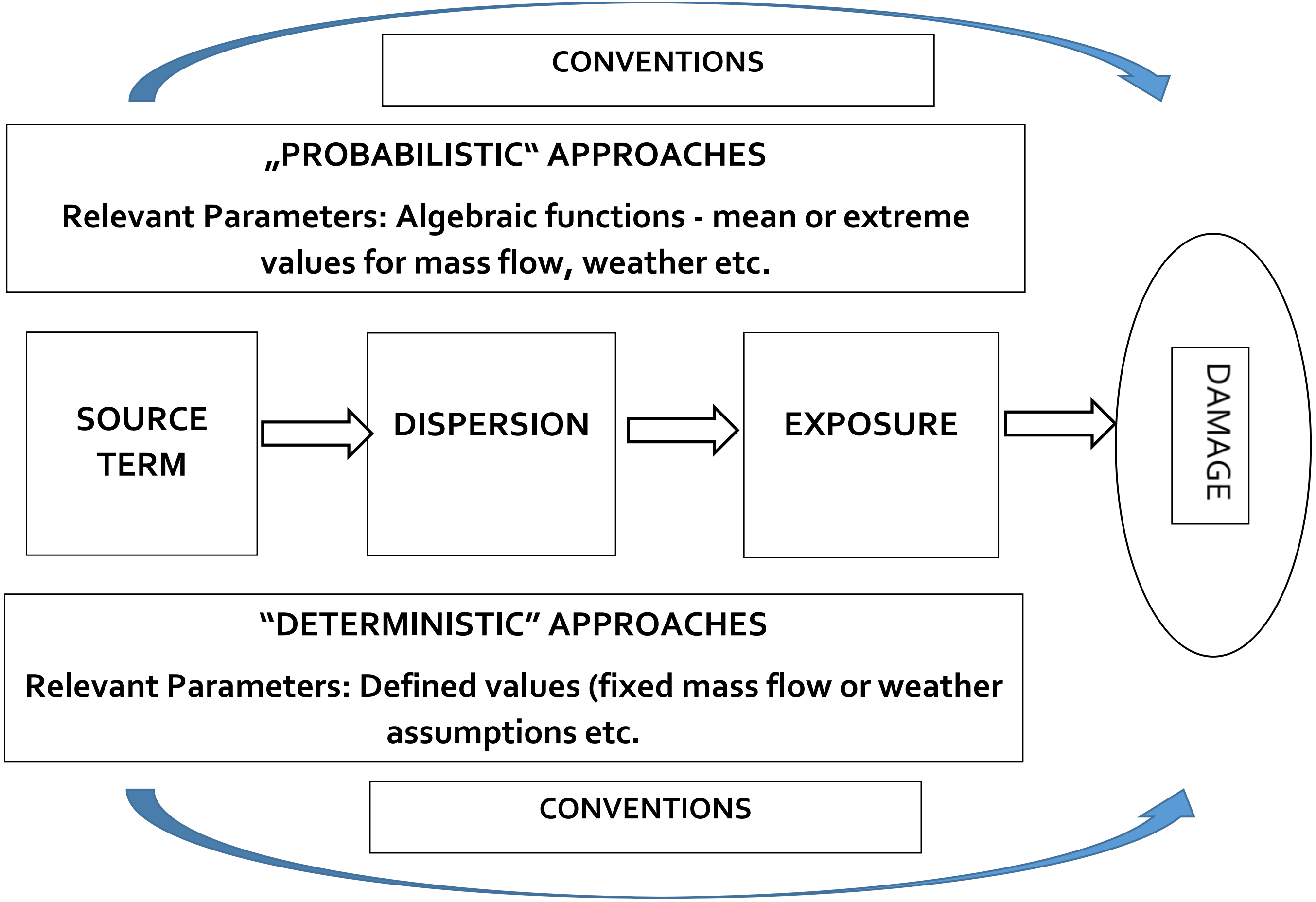


Example

	Parameter	Value
Accident	Leakage	0,008 m
Installation	Ammonia Storage	25 m^3
	Ammonia Pressure	8, 6 bar
Outflow Assumption	Duration	600 sec
	Discharge Coefficient	0,7
	Terrain Roughness	0,1 m
Meteorological Conditions	Air Temperature	20° C
	Humidity	50 %
	Stability Class	D (neutral)
		F (stable)

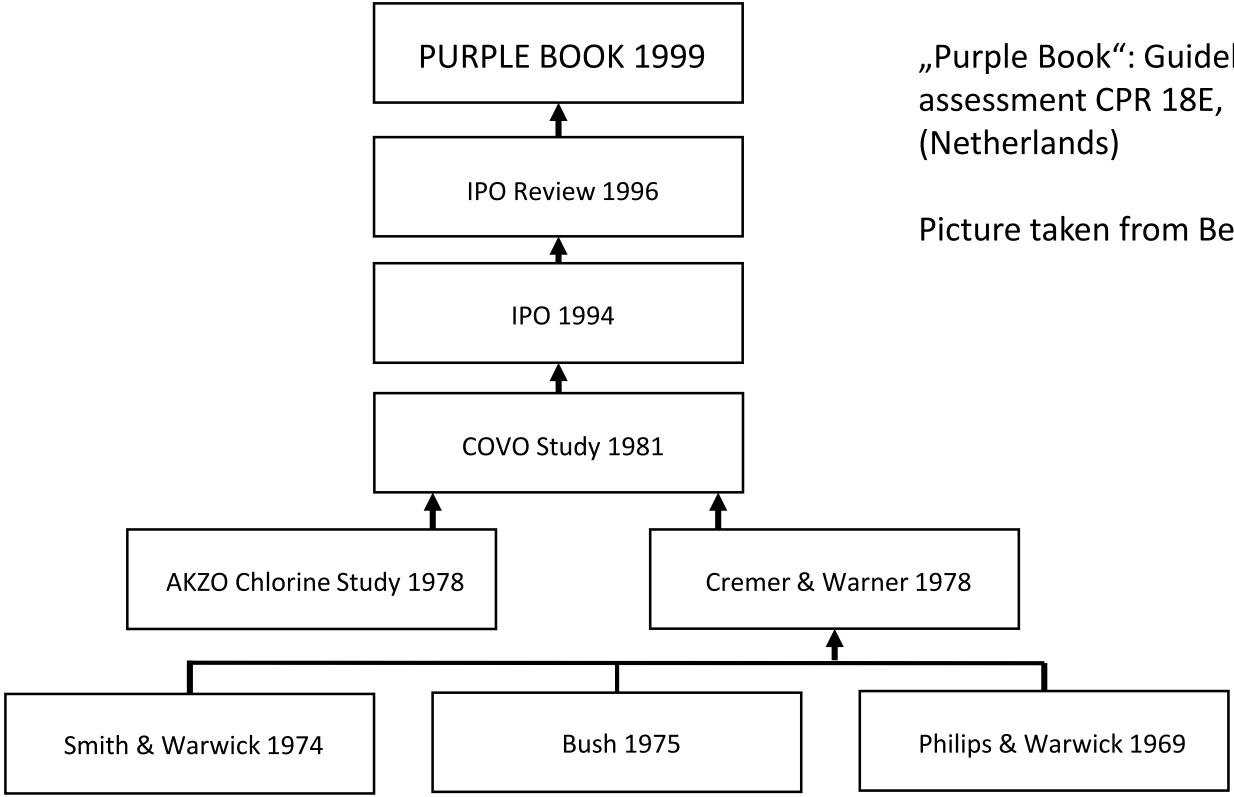
Released Mass	Stability Class	Damage Distance (IDLH)
200 kg	D	168 m
	F	842 m

Change of stability class increases distance by factor 5


CONVENTIONS
„PROBABILISTIC“ APPROACHES
Relevant Parameters: Algebraic functions - mean or extreme values for mass flow, weather etc.
SOURCE TERM
DISPERSION
EXPOSURE
DAMAGE
“DETERMINISTIC” APPROACHES
Relevant Parameters: Defined values (fixed mass flow or weather assumptions etc.
CONVENTIONS

Failure Frequency Data

- Open sources: Purple Book, FRED (UK), Taylor (RELDAT), UK – Offshore
- Generic frequencies with no specific reference to individual cases
- Derived partly from old data (1980s or before)
- „Agreed“ by convention
- Summary in http://www.hse.gov.uk/landuseplanning/failure-rates.pdf
- For some components no figures (no agreed values)
- Harmonization (RHAD etc.) by EU no success
- No industry cooperation



„Purple Book“: Guideline for quantitative risk assessment CPR 18E, review by 2005 (Netherlands)

Picture taken from Beerens et. al. 2006

Risk Assessment

Variation of Failure Frequency Values

(Case Likelihood per Year)

Leakage	PB	HSE	BE	IT
Catastrophic	$5,5x10^{-6}$	$5,0x10^{-6}$	$3,2x10^{-7}$	$1,0x10^{-5}$
Large	$5,5x10^{-6}$	$5,0x10^{-6}$	$1,1x10^{-6}$	$5,5x10^{-5}$
Small	$1,0x10^{-5}$	$5,5x10^{-5}$	$1,2x10^{-5}$	$1,5x10^{-4}$

PB: NL (Purple Book); HSE: UK; BE: Belgium (Flanders); IT: Italy

Comparison by Pasman H., Journal of Loss Prevention, 2011

Risk Assessment

Risikomatrix zur Anwendung des LOPA - Verfahrens für Einzelszenarien der Prozesstechnik			
Häufigkeit			
$10^{-2} – 10^{-3}$ [1/yr]			
$10^{-3} – 10^{4}$ [1/yr]			
$10^{-4} – 10^{-5}$ [1/yr]			
$10^{-5} – 10^{-6}$ [1/yr]			
$10^{-6} – 10^{-7}$ [1/yr]			
Konsequenz Personen-schaden	Verletzung mit > 24 Std. Krankenhaus und/oder reversible Beeinträchtigung/ Verletzung	Irreversible Verletzungen oder Todesfall innerhalb bzw. reversible Verletzungen außerhalb des Betriebsgeländes	Irreversible Verletzungen oder Todesfall außerhalb oder mehrere Todesfälle innerhalb des Betriebsgeländes
Konsequenz Umweltschaden	Weitreichende Folgen möglich, lokale Intervention erforderlich UND reversibler Schaden	Weitreichende Folgen möglich, überregionale Intervention erforderlich UND reversibler Schaden	Irreversible Umweltschäden möglich, überregionale oder nationale Intervention erforderlich

Risk Assessment

- 10^{-6} is a generally acknowledged figure for the acceptable risk (1 in 1 Mio)
- Where did it come from?
- „The Myth of 10^{-6} as as Definition of Acceptable Risk“
- Origin: in 1973 the US – FDA (Food and Drug Administration) needed a value for a „de minimis“ – risk“ (*„de minimis non curat lex“* – the law does not consider small issues)
- Somebody found a scientific publication from 1961 about test methods for carcinogenic substance
- “We just pulled it out of the hat”
- “10^{-6} is essentially zero”

Risk Assessment

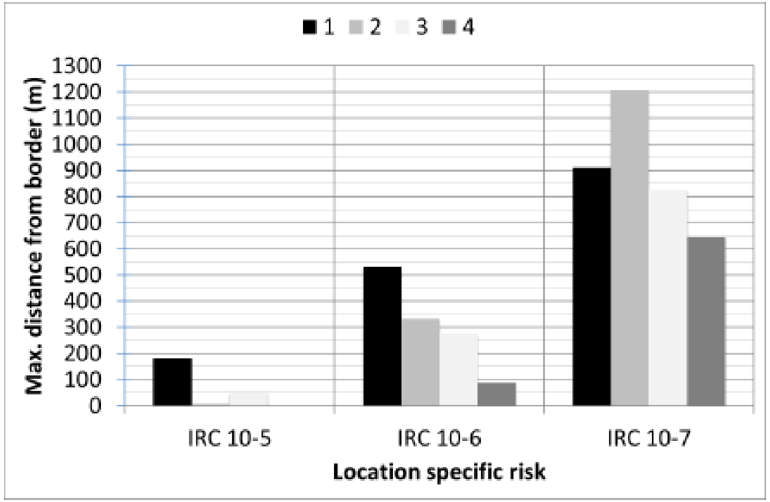
Mortality Cause	**Likelihood per year and person**
Road Traffic (whole population)	$6{,}2 \times 10^{-5}$
Rail Traffic (whole population)	$1{,}2 \times 10^{-7}$
Occupational Accident (workers)	$3{,}4 \times 10^{-5}$
Natural Hazards (all sorts, whole population)	$5{,}9 \times 10^{-7}$
Median	$\approx 2{,}4 \times 10^{-5}$
Recommendation for acceptable risk	$1{,}0\times 10^{-6}$

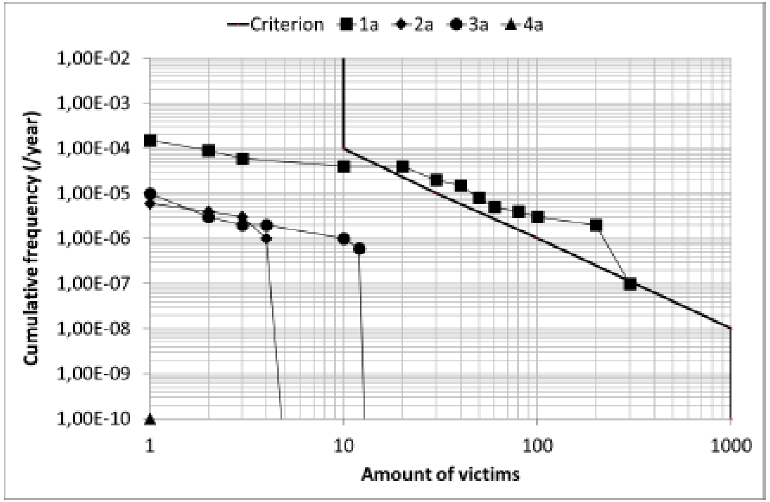
Average Statistical Data of Russia

Risk of fatality for any reason	$1{,}60\times10^{-2}$ per $year^{-1}$
Risk of fatality at natural disaster	$1{,}87\times10^{-7}$ per $year^{-1}$
Risk of fatality in aircraft crash	$4{,}30\times10^{-7}$ per $year^{-1}$
Risk of fatality at fire	$7{,}4\times10^{-5}$ per $year^{-1}$
Risk of being murdered	$2{,}73\times10^{-4}$ per $year^{-1}$
Risk of fatality in car accident	$2{,}2\times10^{-5}$ per $year^{-1}$
Risk of fatality because of accidental poisoning with alcohol	$2{,}97\times10^{-4}$ per $year^{-1}$

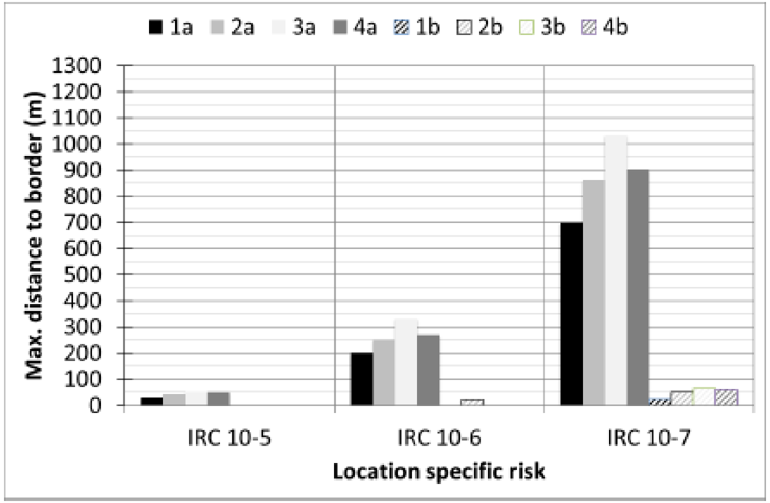
10-6
10-8
10-3
10-4
10-5
10-7
10-9
EPA of Western Australia
New South Wales Australia
Hong Kong
Netherlands (proposed facilities)
Netherlands (existing facilities)
UK (large development), 1989
UK (small development), 1989
UK, 2001
Petroleos de Venezuela
РФ (ФЗ-123), 2008
РФ (ФЗ-123), 2012
Netherlands
Russia

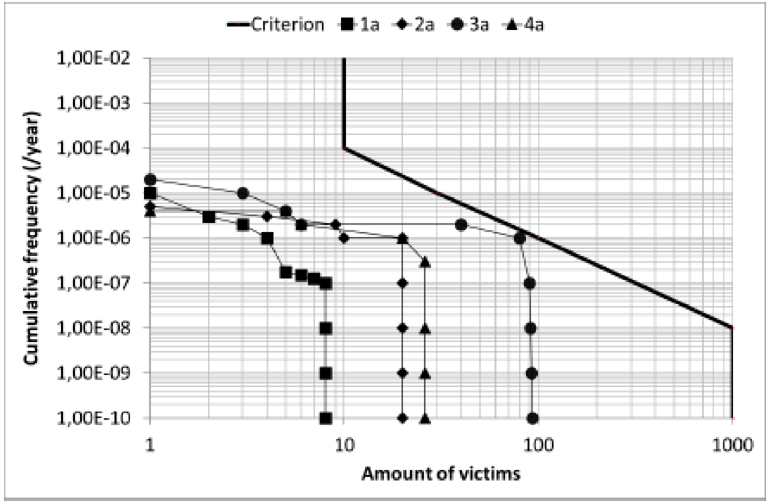
First calculation



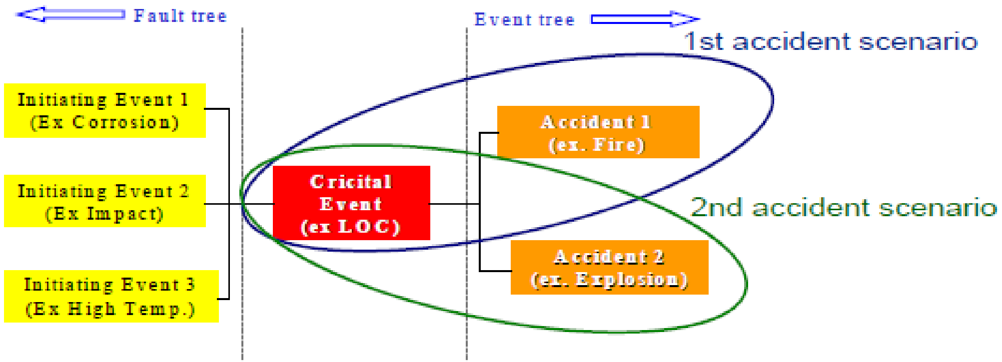


Final calculation





Scenario for LUP derived from classical "BOW-Tie"



National Approaches

- Many countries (UK, NL, France, Italy, Switzerland) perform a „Mini – QRA“ for bigger sites
- For smaller sites fixed distances are common
- The QRA starts from agreed standard – scenarios (e.g. UK ca. 35) or from scenarios defined by the operator
- Selection of scenarios by cause-tree likelihood is possible but complicated
- Different forms how to take into account barriers (e.g. only passive)
- QRA - result is either fixed consequence-based (reversible/irreversible effects), probabilistic consequence-based (probit functions) or the consequences are transformed into risk figures (individual, societal)

Zoning

- The zoning follows the result (effect thresholds, probits, risk figures)
- Usually critical thresholds (lethal, irreversible etc.)
- Risk figures: 10^{-5} or 10^{-6}
- Allowed use within the zone defined by categories (e.g. PADHI/UK)

Level of sensitivity	Development in inner zone	Development in middle zone	Development in outer zone
1	DAA	DAA	DAA
2	AA	DAA	DAA
3	AA	AA	DAA
4	AA	AA	AA

<u>Level Examples</u>
Level 1: workplaces etc.
Level 2: Housing development ≤30 units or hotels ≤ 100 beds
Level 3: Housing development > 30 units or shopping centre ≤ 5000 m^2
Level 4: Hospitals or public building for more than 1000 people

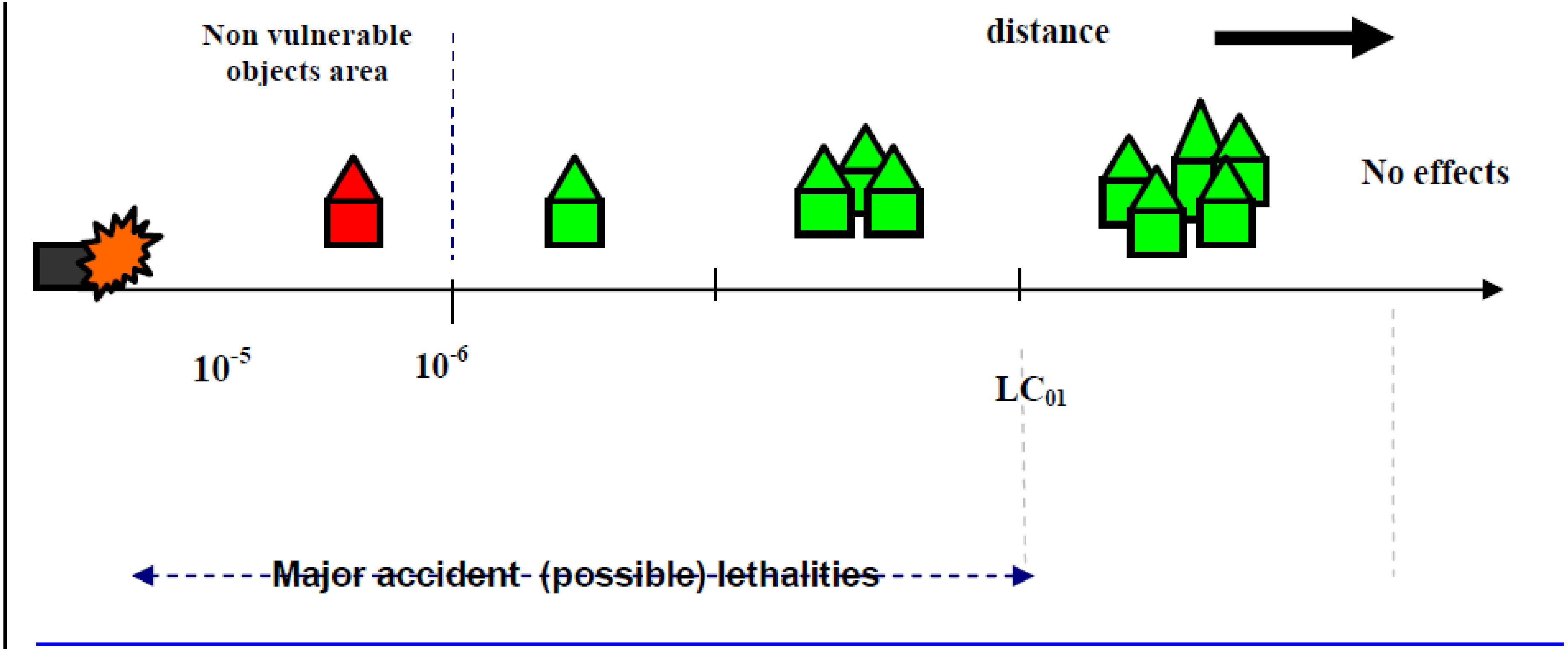
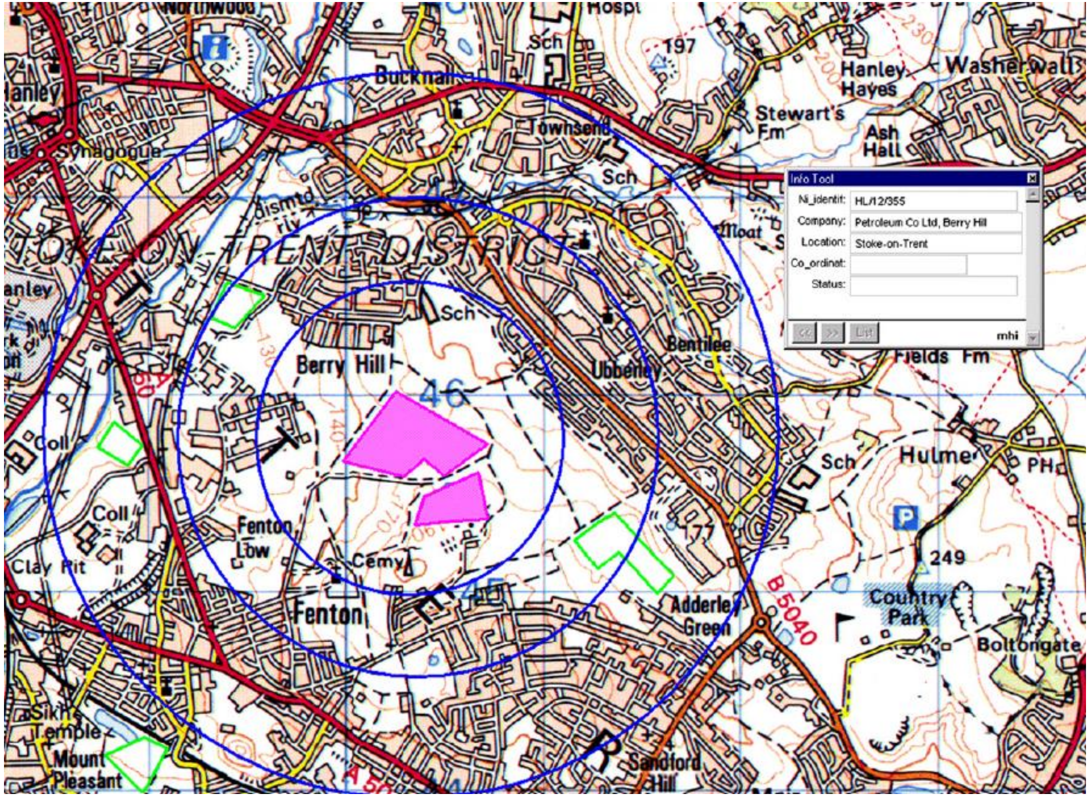
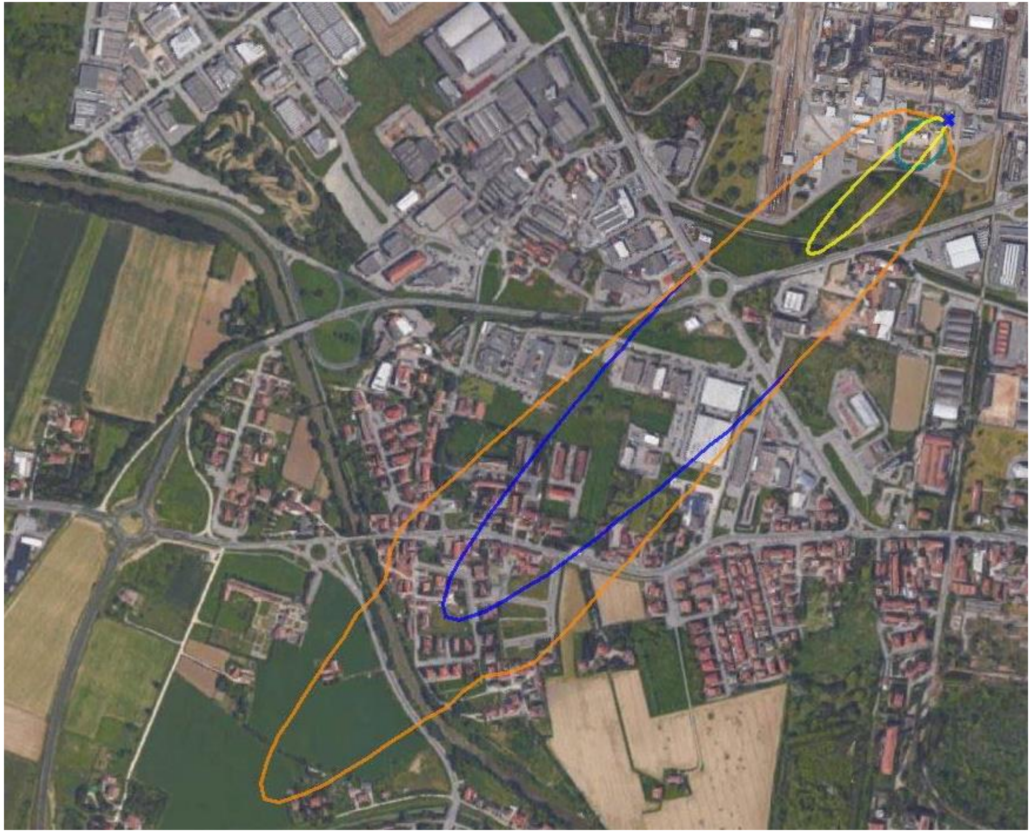


FIG 13 Safety distances and vulnerable objects in the Dutch approach



UK Example: Inner, Middle, Outer Zone = 10^{-5}, 10^{-6}, 0, x 10^{-6} for receiving a „dangerous dose“



Effect Distances

Personal Conclusions

- It is not meaningful to link a LUP decision with a safety report because this depends on too many details and it will not be available before a „greenfield“ development
- It provokes political pressure to find solutions (technical measures etc.)
- The problems of assumptions and conventions are easier to solve if there are generic scenarios only for LUP
- The result of a LUP scenario is a pragmatic consultation basis and no safety distance (a safety distance is a „conservative“ calculation)
- It is critical to link a LUP decision totally with a permit

Austria & Seveso

- 165 Seveso sites
- 82 upper tier
- 83 lower tier

Austrian Competencies

Topic	Legal Competency
• EIA	Sustainability Ministry
• Waste	Sustainability Ministry
• Mining	Sustainability Ministry
• Explosives	Interior Ministry
• Water	Sustainability Ministry
• Public Information	Sustainability Ministry
• Industrial Permitting	Digital & Economic Ministry
• Occupational Health & Safety	Labour & Social Affairs Ministry
• Building & Land-Use Planning	Regional
• External Emergency	Regional

Austrian LUP / Seveso Approach

- Mixture of pragmatic and mathematic approach
- 100 m minimum distance when exceeding the lower threshold (lower-tier)
- 300 m minimum distance when exceeding the upper threshold (upper-tier)
- 1000 m maximum distance
- Actual distance is based on the ratio between substance amount on site and threshold quantities given by the Directive annex
- Couple of formulas to define the distance
- Between lower and upper tier linear interpolation, then logarithmic interpolation
- Individual replacement of calculation by scenario assumptions possible

Distance Examples Austrian Approach

Substance	Threshold Annex I (tons)	Amount Example (tons)	Distance (m)
Acute Toxic Cat. I	5/20	5 / 50	100 / 390
Acute Toxic Cat. II	50 / 200	100 / 1000	150 / 460
Chlorine	10 / 25	100	440
Methanol	500 / 5000	1000	120
Ammonia	50 / 200	100 / 10000	150 / 690
LPG	50 / 200	100 / 1000	150 / 460
Flammable Liquids Cat. II (5c)	5000 / 50000	10000 / 100000	120 / 370

Individual LUP Scenarios (Austria)

Hazard Category	Scenario	Effect	Effect Value
Liquified flammable gases	BLEVE	a) Overpressure b) Thermal Radiation	a) 0,05 bar b) 500 TDU
Flammable liquids & pyrophoric liquids and solids	Fire	Thermal Radiation	3,0 kW/m^2
Flammable gases and liquids	UVCE	Overpressure	0,05 bar
Acute Toxicity & Specific Target Organ Toxicity	Toxic Release	Human Health	AEGL 2 30 minutes

Austrian Situations

Lenzing/Upper Austria

Kundl/Tyrol

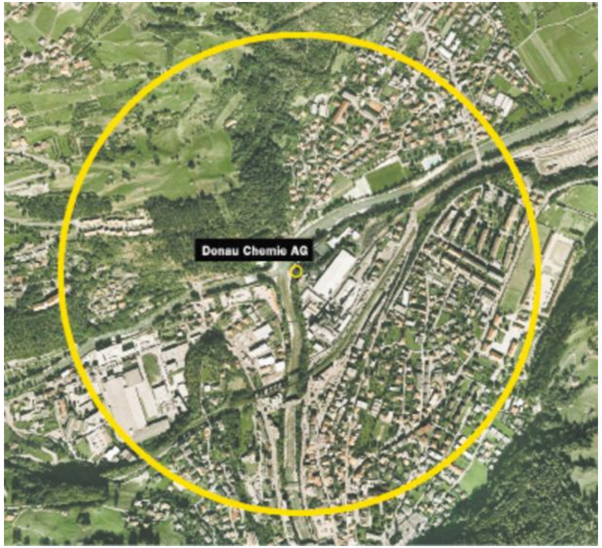
Austrian Situations

Near Linz / Upper Austria

Case in 2003/2004:

- Extension of a chemical storage site
- Yellow line effect calculation ca. 300 m
- Red line after „voluntary“ substance amount reduction ca. 150 m
- Strong political influence after various press articles

Austrian Situations



Landeck/Tyrol

- Site came 2014 into Seveso scope because of new substance classification
- Political pressure to reduce distance to below site border by different measures

Austrian Seveso/LUP - Implementation

- According to the Austrian legislation the industrial permit has no reference to the land-use type (only the building permit to be applied for has this – it is a parallel system)
- The land-use legislation is regional (Länder), the actual competency and the one for the building permit is situated at the community
- The industrial permit legislation is federal but the implementation is done by the districts
- Consequence: confusion
- The regional land-use and building laws have parts referring to the respective Seveso article but no in-depth concept
- There is no obligation to make entries of the separation distance in the land register (in order to make it visible on maps etc.)
- The distance is calculated by technical experts of the regional authority after „informal“ requests by the communities – no formal process

Austrian Seveso/LUP - Implementation

- The LUP – distance calculation tool was developed after a „hot potatoe“ process between planners and technical experts
- It is easy to use and delivers „politically acceptable“ distances keeping in mind that these are no absolute safety distances
- As it refers to the threshold values it transposes all „illogical“ factors as the thresholds are not entirely scientific –based
- It comprises various pragmatic elements
- The results are not understood by the broad public (lack of risk communication policy)
- No application for SEA or EIA (all cases where done for individual sites, existing or enlargement cases)

Austrian Seveso/LUP - Implementation

Zoning in Austria (depending on regions)

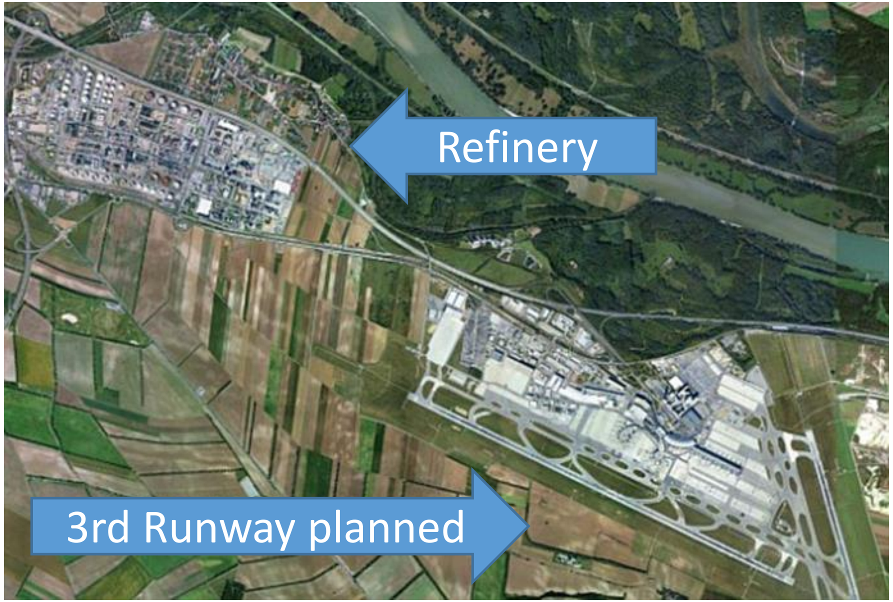
- No use allowed (misunderstanding of the Directive)
- Reduction of the distance by measures
- Lists of allowed forms with different criteria, e. g.
  - Enlargement of existing houses without increase of population
  - Developments that do not increase the overall population of the community by a certain percentage
  - Closure of 2 – 3 building site „leaks“

Scenarios

- For pure safety report purposes qualitative scenarios (if needed by a HAZOP etc.)
- For LUP purposes no scenarios in the safety report
- For emergency response scenarios which are „a bit bigger“

LPG	BLEVE of a vessel or a delivering tanker
Flammable liquids, pyrophoric solids or liquids	Fire of a catchment pool or of connected fire loads
Flammable liquids and gases (vapour)	UVCE after 10 minutes release, 80 mm leakage
Toxic cloud	10 minutes release, 80 mm leakage

Vienna Airport EIA



EIA for 3rd runway Vienna airport:

- Seveso Dir. requirements of low interest
- Short quantitative assessment
- Areas of „extended risk“ including the refinery but no further conclusions

Frankfurt Airport LUP Case

Major accident frequencies

- $1{,}6 \times 10^{-5}$ p.y. without new runway
- $3{,}3 \times 10^{-5}$ with new runway
- „Significant“ risk increase?

No final decision, complete „voluntary“ relocation of plant for 650 Mio Euros in 2006 paid by airport company (with 3,2 Bio Euros calculated for the airport extension in 2006)

Federal Ministry
Republic of Austria
Digital and
Economic Affairs

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Danke für Ihre Aufmerksamkeit!

Thank you for your attention!

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