



MIACC Risk Screening

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Objectives

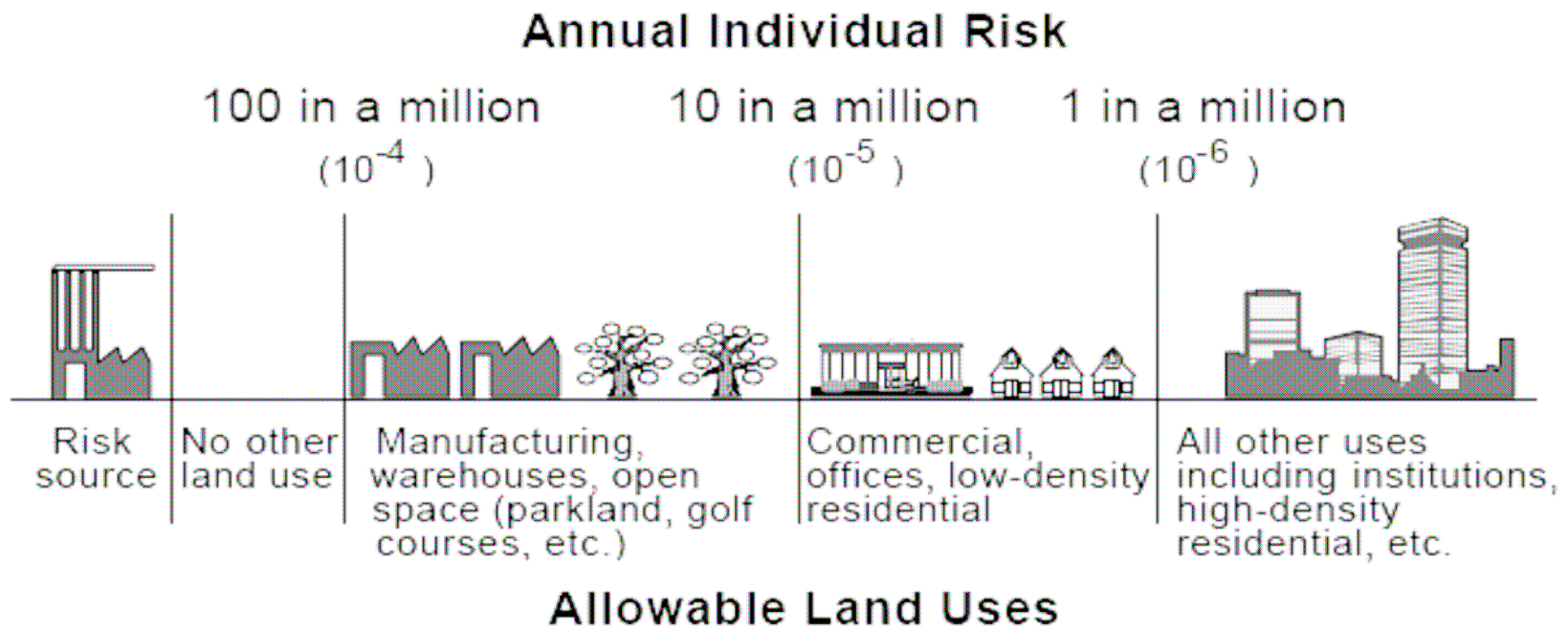
- ◆ Review the MIACC approach for Land Use Planning
 - Criteria
 - Screening Approach (Initial Screening Tool)
- ◆ Current Usage
- ◆ Drivers
- ◆ Benefits

MIACC – Initial Screening Tool

"The Purpose of this Guide is to aid municipalities and industry in assessing the risks to public safety associated with hazardous substances. It is a tool that can be used to identify the potential impact from the release of a hazardous substance."

Risk Assessment - An Initial Screening Tool, 1997 ed.

Criteria (Requirement)



Risk Assessment – Recommended Practices for Municipalities and Industry, CSE www.chemeng.ca

Risk Criteria Approach

- ◆ Based on Geographic Risk Concepts
 - Relatively ease to evaluate
 - Relatively ease to describe
- ◆ Suggests Societal Risk Concepts
 - Reflects population density issues
- ◆ Issue as to where do Roadways fit

Methodology (Optional)

"When the application of the initial MIACC methodology determines that a particular installation presents an unacceptable risk to the community, further analysis may show there is not a concern."

Risk Assessment - An Initial Screening Tool, 1997 ed.

Risk Screening Approach

- ◆ Key words “Initial Screening Tool”
 - Easy to Apply
 - Doesn't require a lot of information
 - Doesn't require a lot of time
- ◆ Assumption is that it is very Conservative
 - Further work is always an option

Risk Calculation

$$R_d = F \times P_1 \times P_2 \times P_3$$

R_d = Individual risk at distance d

F = Frequency of Release

P_1 = Probability of exposure at d , give the release

P_2 = Probability of failure to shelter, shield, or evacuate

P_3 = Probability of fatality at d , given the exposure

Probabilities

◆ Probability of Exposure

- $P_1 = 1$ (if within d exposure is assumed)

◆ Probability of Failure to Protect

- $P_2 = 0.1$ (90% chance of escape)

◆ Probability of Fatality

- $P_3 = 1$ (if escape fails fatality is assumed)

- Probabilities are assumed to be conservative

Focus on Two Scenarios

◆ Small Event

- 10% of inventory released over 30 minutes
- One release every 100 years (F is defined)

◆ Big Event

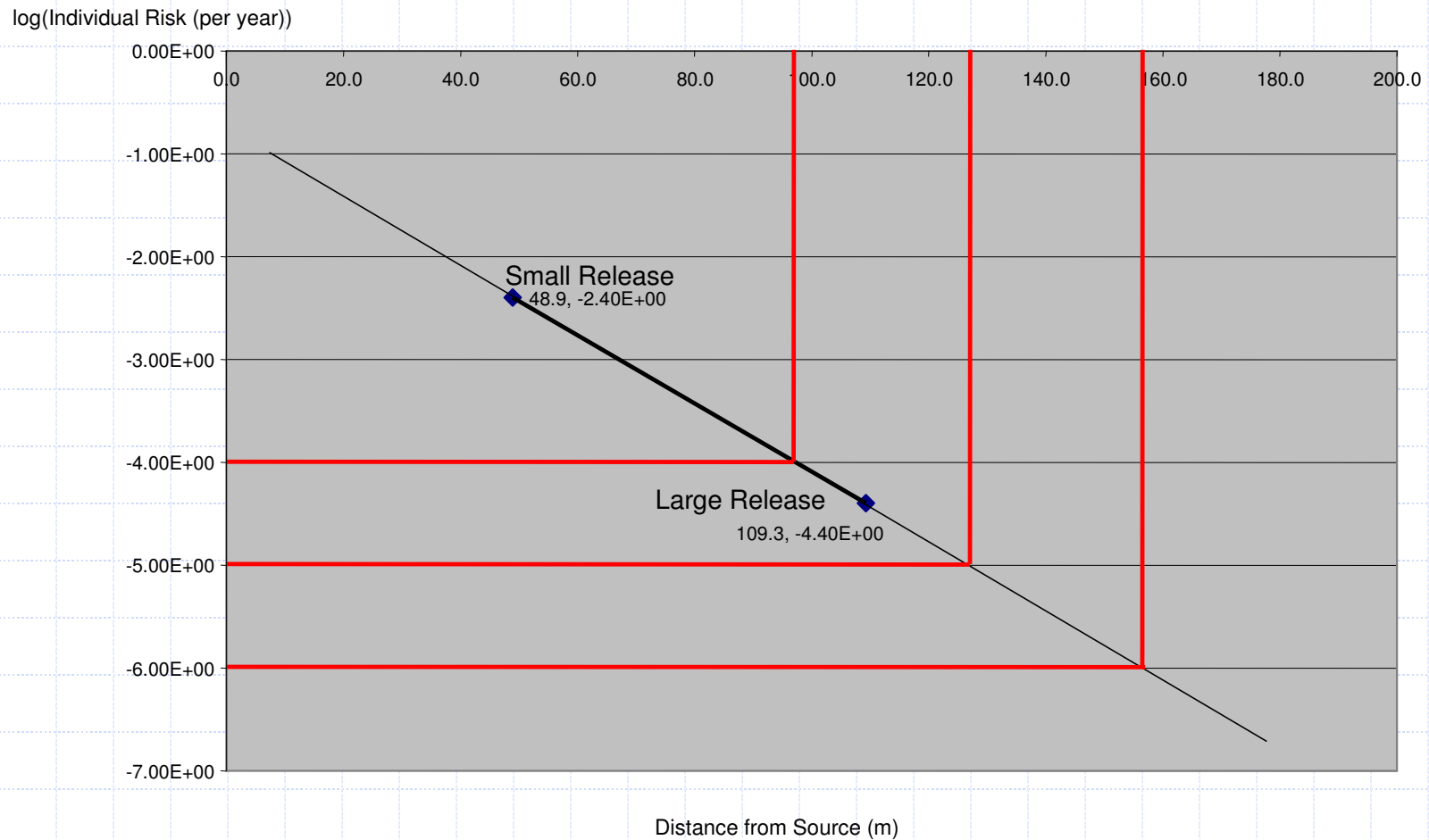
- 100% of Inventory over 30 minutes
- One release every 10,000 years (F is defined)
- Assumption that F is conservative

Determination of Distance (d)

- ◆ Dutch Guide is the basis of the Methodology
 - Function of Material Properties (phase of the material, flammability, toxicity)
 - Number of Outcomes are Considered based on the Nature of the Material (Pool Fires, Vapour Clouds, Toxic Releases)
- ◆ i.e. 100 Tonnes of Butane $d = 85$ m

Mathematical Data Treatment

Sample Data Plot)



Benefits of the MIACC Approach

- ◆ Very simple to apply
 - Data inputs are readily available and defined
 - Little room for interpretation of the values
- ◆ Believed to be conservative in nature
 - Each of the inputs are typically considered to be conservative
 - Does not limit further analysis

Use of MIACC Criteria

- ◆ Sturgeon County (NW of Edmonton)

- Bylaw 819/96 - 6.21.3 (b) iv)

"determine annual individual risk and compare to MIACC's risk acceptability criteria;"

http://www.sturgeoncounty.ab.ca/pdf_files/bylaw_oct04.pdf

- Similar Bylaws apply throughout the Alberta Industrial Heartland (Edmonton Industrial area)

Implications

- ◆ MIACC may not be in existence
- ◆ But MIACC requirements are in existence
 - Municipal requirement (Land use bylaws)
 - Separate from Provincial (Alberta) Energy and Utility Board requirements
- ◆ Criteria isn't flexible but the approach and calculations are flexible

Typical Company Drivers

- ◆ They want to meet the county requirements (protect the public)
- ◆ They want to be upfront about the risks their operations represent
- ◆ They want to proceed in a non-confrontational manner
- ◆ They want their approval as soon as possible

Typical County Drivers

- ◆ They want to protect the public
 - Why they have asked for MIACC calculations
- ◆ They want to be able to verify and trust the results of the various risk studies
 - Often they want to know the qualifications of the person doing the work
 - Often they advise that a third party will review the work

My Drivers

- ◆ I want the work to be recognized as being based on MIACC
- ◆ I want to keep the calculations simple
- ◆ I do not want to get questions from the counties when they review my work
 - Minimum number of assumptions
 - The work needs to be readily reproducible
- ◆ I want to clearly be conservative

Common Drivers

- ◆ Protect the Public
- ◆ Share appropriate risk information
 - Avoid confidentiality issues (public data)
 - Limit Liability (avoid further commitments)
- ◆ Avoid debate (debate equals delays)
 - Agree on the approach
 - Agree on the assumptions
 - Agree on the results

Why Avoid Debate

- ◆ Counties are likely only to challenge when they believe risks are understated
 - Companies do not want the perception that they are understating actual risk
 - Companies do not want the perception that they are challenging the requirements
 - Companies do not want the relationships to become confrontational
 - Companies do not want delays

Benefits of the Screening Tool

- ◆ Likelihood of Debate is minimized
 - MIACC Methodology
 - Simple (public) Inputs
 - Key assumptions are already made
 - Information can be readily shared
 - Analysis can be readily reproduced
- ◆ Protects the public (Conservative)
 - Protects the image of the corporations

Weakness of the Methodology

- ◆ Needs to better address risk elements such as pipelines
- ◆ Needs to better address liquids that are above their flashpoint (Pentane/Diluent)
- ◆ Needs to address flow rate issues
- ◆ Needs to address other hazardous events (BLEVEs, Jet Fires)

Conclusions

- ◆ Not perfect but it gets things done
 - If you are conservative and OK why go further
 - Allows for data to be shared
 - Minimizes debate
- ◆ The CSChE should support this approach
 - Because it works