Our Approach to the Implementation of Safety-Distance Requirements in Rheinfelden, Baden, Germany

Decision-making processes and the challenges of cross-boundary land-use planning

Klaus Eberhardt
Mayor of Rheinfelden (Baden)
Historical development
Excellent business location

Sustainable energy source

Attractive shopping areas

Quiet residential streets

Scenic surroundings for recreation and relaxation
Zoning plan
Grendelmatt III
Zoning plan
Grendelmatt III
The industrial site is:

• an ‘establishment’ as defined by the German Hazardous Incident Ordinance,

• an industrial establishment under the Seveso Directive, and

• a 'hazardous activity' under the UNECE Convention on the Transboundary Effects of Industrial Accidents, which means "any activity in which one or more hazardous substances are present or may be present in quantities at or in excess of the threshold quantities listed in Annex I hereto, and which is capable of causing transboundary effects."
Urban development in line with the Seveso III Directive
2 sites = 1 ‘establishment’ as per Section 3, definition 5a of the German Federal Immission Control Act

Industrial sites in Rheinfelden: Evonik
Industrial sites in Rheinfelden:

Urban development in line with the Seveso III Directive
1 additional ‘establishment’ within the Evonik north site

RheinPerChemie
Evonik

High purity chlorosilanes

Glass fibres

Evonik

Chlorosilanes

SiCl₄, SiHCl₃, H₂

Filler materials

Pyrogenic silicic acids

Organosilanes

Anti-graffiti, building protection

RheinPerChemie

Elektrolytic and chemical manufacture of ammonium and sodium persulphates (Radical formers for polymerization processes, oxidizing agents)

Rheinforden

Baden-Württemberg
<table>
<thead>
<tr>
<th>Classification under the Hazardous Incident Ordinance</th>
<th>Major potential hazards</th>
</tr>
</thead>
</table>
| Evonik | Release of  
| Threshold quantity as per Column 5 of Annex 1 of the Ordinance exceeded for a range of substances/substance categories, e.g. highly toxic, toxic, oxidizing, environmentally hazardous, highly flammable substances or those reacting violently with water*  |
| Rhein-PerChemie |  |
| Threshold quantity as per Column 5 of Annex 1 of the Ordinance exceeded for toxic and oxidizing substances (NH₃, persulphates)* |

The regional administrative authority in Freiburg is responsible for the approval and monitoring procedures for nearly all matters relating to environmental protection and occupational health and safety at the Rheinfelden industrial sites.

*Classification under the UNECE Industrial Accidents Convention – Annex I

**Industrial sites in Rheinfelden: hazardous substances and potential risks**
Extensive incident response facilities as per Section 3 (3) of the Hazardous Incident Ordinance

Incident prevention measures, in some cases even more stringent than the latest safety standards (> Licensing procedure)

Implementation of the general operator obligations, additional obligations with safety report, contingency planning, information brochure, etc.

Industrial sites in Rheinfelden:

Existing built environment and implementation of the Hazardous Incident Ordinance
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Safety distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996-2000</td>
<td>Seveso II Directive Implementation of Section 12 in German law</td>
<td>‘Appropriate safety distance’</td>
</tr>
<tr>
<td>2003/2004</td>
<td>Adelberg development plan: homes to be at a distance of 100 m from Evonik; bringing the town closer to the Rhine; Freiburg specifies appropriate safety distance.</td>
<td>750 m (NH₃; derived from disaster control scenario) 200 m (HCl from hydrolysis of chlorosilanes; derived from disaster control scenario)</td>
</tr>
<tr>
<td>Since 2004</td>
<td>Heightened awareness of the issues in the town; in addition to land-use planning procedures, building applications pursuant to Section 34 of the Federal Building Code are always submitted; Freiburg specifies the consultation radius.</td>
<td>Application of Section 50 of the Federal Immission Control Act</td>
</tr>
<tr>
<td>Year</td>
<td>Event Description</td>
<td>Safety Distance Notes</td>
</tr>
<tr>
<td>------</td>
<td>-------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>2005</td>
<td>Adelberg development plan: submission of a meteorological appraisal and other factors prompt a re-evaluation of the appropriate safety distance by Freiburg. ‘Safety distance list’ (SFK-TAA-GS1) drafted by federal ministries. Appropriate safety distance: 450 m (NH₃; disaster control scenario/average dispersion situation).</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>Adelberg development plan: the town annuls plans within the 450 m radius. Citizen’s information event on Section 50 issues presented jointly by the town and the Freiburg regional administration.</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Rheinfelden hydropower project: the areas around the industrial sites to be upgraded as social and cultural amenities. Freiburg specifies the minimum safety distance; after some discussion the project is rejected. Appropriate safety distance: 450 m (ammonia).</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>Plethora of position statements by Freiburg on building applications/development plans within the consultation radius (9 in the first half-year); backlog in decision-making for many individual cases. &gt;&gt;&gt; Joint discussions between town, Freiburg and Evonik Freiburg’s proposal: a location assessment. Consultation: 600–800 m. Appropriate safety distance: 450 m (NH₃).</td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>Description</td>
<td>‘Safety distances’</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>2013</td>
<td><strong>Location assessment to determine appropriate safety distances as recommended by the KAS-18 guidance document: mandated by the town and Evonik, with technical support from Freiburg.</strong>&lt;br&gt;&lt;br&gt;<strong>Objective:</strong> Systematic examination of the industrial sites to identify potential hazards as per Section 50 of the Federal Immission Control Act, with evaluation of scenarios under status quo conditions as a basis for subsequent planning considerations</td>
<td></td>
</tr>
<tr>
<td>2012–2014</td>
<td><strong>Amendment of the land-use plan</strong>&lt;br&gt;Appropriate safety distance: 450 m (ammonia)</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td><strong>Submission of the assessment by TÜV Nord:</strong>&lt;br&gt;The convention for substances reacting with water in the KAS-32 guidance document published in 2015 (50% hydrolysis) means that this potential hazard dictates the required safety distance (previously only about 200 m).&lt;br&gt;Appropriate safety distance: 400–450 m (NH₃), 600–850 m (substances reacting with water)</td>
<td></td>
</tr>
</tbody>
</table>
### Safety distances

#### 2015

Submission of the location assessment by TÜV Nord:

In view of the site conditions and the factors precluding hazardous incidents and limiting their impact, the scenario tends to err on the safe side.

Commentary on graded limitations of use for areas near to the industrial sites and further away from them (zoning of the protection requirements within the specified safety distance)

#### 2015/2016

Creating and approving the Rheinfelden urban development plan and the guidelines for building approval procedures

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**Application of Section 50 of the Federal Immission Control Act**

**Progress of Implementation in Rheinfelden**

<table>
<thead>
<tr>
<th>‘Safety distances’</th>
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<tbody>
<tr>
<td>Appropriate safety distance: 400–450 m (NH₃), 600–850 m (substances reacting with water)</td>
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</table>
Producing an urban development plan in line with the Seveso III Directive
1. In the event of a ‘beyond-design accident’, the risk in the vicinity of installations where a hazardous incident could occur must not be increased by land-use planning (and its implementation).

2. An appropriate safety distance must remain between installations where a hazardous incident could occur and new facilities that qualify for protection.

Basis:
Article 13
Seveso III Directive
Section 50
Federal Immission Control Act
<table>
<thead>
<tr>
<th>Assigned degree of protection</th>
<th>Planned use</th>
</tr>
</thead>
</table>
| None                          | Projects not falling under the Seveso III Directive  
  • Commercial premises not open to the public  
  • Office buildings not open to the public  
  • New residential buildings that do not, however, qualify as a new residential area (assumed to be up to 6 residential units), in built-up areas, e.g. building on a vacant plot or in a second row  
  • Alterations / extensions to existing residential buildings (e.g. dormer windows, loft conversions)  
  • Parking facilities  
  • Routes of minor significance, such as the planned new footbridge over the Rhine |
| Low                           | • Buildings used by the public | business and administration offices | buildings and facilities open to the public  
  • Guest accommodation (hotels)  
  • Residential areas |
| Medium                        | • Schools and children’s nurseries  
  • Care homes and day centres for seniors  
  • Sports grounds  
  • (Open-air events) |
| High                          | ‘Vulnerable’ planned facilities with a very large catchment area (beyond the town itself) and dimensions, such as (new) hospitals and similar large institutions and recreation areas |
Urban development plan
In line with the Seveso III Directive
Urban development plan in line with the Seveso III Directive

Land-use plan

Plan in line with the Seveso III Directive

Changes in the planning
<table>
<thead>
<tr>
<th></th>
<th>Planning zone 1</th>
<th>Planning zone 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential areas</td>
<td>Residential areas with 20 accommodation units (as lower limit) generally possible</td>
<td>Residential areas with 40 accommodation units (as lower limit) generally possible</td>
</tr>
<tr>
<td>Schools and children’s</td>
<td>No new build</td>
<td>No new build</td>
</tr>
<tr>
<td>nursery, care facilities</td>
<td>No extension of existing facilities that would increase the number of people</td>
<td>Extension of existing facilities generally possible</td>
</tr>
<tr>
<td>for senior citizens</td>
<td>particularly in need of protection</td>
<td></td>
</tr>
</tbody>
</table>

Urban development plan in line with the Seveso III Directive

Evaluation of individual projects
### Urban development plan in line with the Seveso III Directive

<table>
<thead>
<tr>
<th>Buildings used by the public / Buildings and facilities open to the public</th>
<th>Planning zone 1</th>
<th>Planning zone 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>The establishment of retail shops, service businesses, offices and restaurants—and the extension of existing ones—in the town centre shopping area is generally possible provided that the character of that area is retained. In the case of retail outlets with large floor areas, places of public assembly or other facilities where a large number of people may congregate: examination of the special individual case is essential.</td>
<td></td>
<td>On the Schildgasse commercial estate: location of retail outlets with large floor areas on a scale as per the land-use plan</td>
</tr>
</tbody>
</table>

**Evaluation of individual projects**
### Urban development plan in line with the Seveso III Directive

<table>
<thead>
<tr>
<th>Planning zone 1</th>
<th>Planning zone 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Guest accommodation</strong></td>
<td><strong>New guest accommodation with up to 10 beds generally possible</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation of individual projects**
- New residential buildings that do not, however, qualify as a new residential area (up to 6 residential units), in built-up areas, e.g. building on a vacant plot
- Alterations / extensions to existing residential buildings (e.g. dormer windows, loft conversions)
- Commercial premises not open to the public
- Office buildings not open to the public
- Parking facilities
- Routes of minor significance, such as the planned new footbridge over the Rhine

Individual projects not falling under the Seveso III Directive
Proposed building **project**

- **Does the project site lie within the ‘appropriate safety distance’?**
  - Yes
  - **Further examination of the hazardous incident issue not necessary, i.e. approval taking hazardous incident aspects into consideration possible.**
  - No

- **Is it a site worthy of protection according to the Seveso III Directive?**
  - Yes
  - **Examination of individual case**
  - No

- **Does the project site lie within a land-use plan that already takes the hazardous incident issue into account? The project conforms with the land-use plan?**
  - Yes
  - **Positive appraisal: approval taking hazardous incident aspects into consideration possible.**
  - No

**Reconstructable appraisal process by the building control authorities**

- Does the project result in a worsening of the status quo?
  - Yes
  - Check against Table 3
  - Indiv. assessment if needed
  - Socioeconomic aspects
  - Organizational measures
  - Technical measures

- **Result**
  - Possible to comply with due consideration for neighbours, if necessary with restrictions?
  - No
  - Negative appraisal: Rejection
  - Yes
  - Positive appraisal: approval taking hazardous incident aspects into consideration possible.

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**Flowchart for building approvals**
Urban development plan in line with the Seveso III Directive
Urban development plan in line with the Seveso III Directive

June 2015 – April 2016
Discussions, workshops, tie-in with Freiburg and Evonik

May 2016
Introduction, urban dev. plan—drafting in the committees

June 2016
Citizen’s information event

July 2016
Involvement of the public and the authorities

September 2016
Review of representations
Vote

November 2016
Resolution as informal plan as per Section 1 (6) No. 11 of the Federal Building Code

December 2016
Internal announcement

Evaluation: To date no negative events. Two major housing proposals were rejected at an early stage.
That’s all for now, folks!