



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Confederation

Federal Department of the Environment,  
Transport, Energy and Communications DETEC

**Federal Office for the Environment FOEN**  
Hazard Prevention Division

# **30 years after the Sandoz accident**

-

## **Lessons learned for preventing transboundary water pollution**

**Dr. Martin Merkofer**

**Swiss Federal Office for the Environment  
Head of the Major Accident Prevention Section**

**Side Event COP9, 30 November 2016**



# Agenda

Sandoz accident and its consequences

Swiss Ordinance on Major Accidents – lessons learned

Transboundary cooperation

Fire water retention strategy in Switzerland

Conclusions



# The Sandoz accident...

*1 November 1986 at Schweizerhalle*





# ...Political debate...

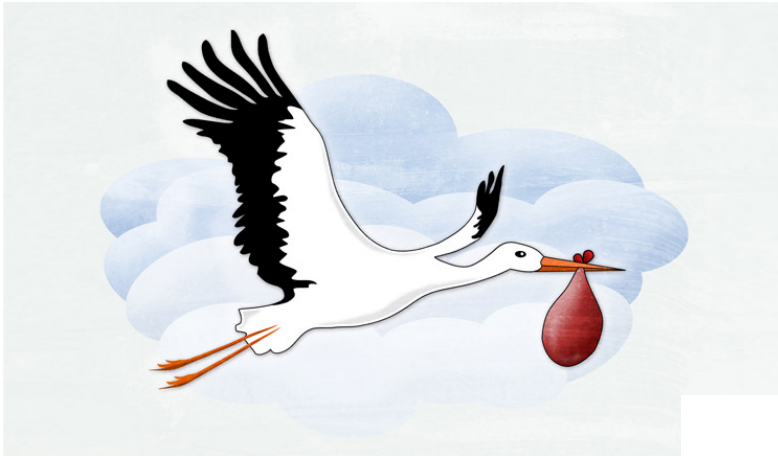


## Political debate in the Federal Council and in the United Federal Assembly

*2.12.1986: Federal Council appeared before the United Federal Assembly and declared that a major accident ordinance was needed.*



# ... the birth of the major accident ordinance in Switzerland



## **Verordnung über den Schutz vor Störfällen (Störfallverordnung, StFV)**

814.012

vom 27. Februar 1991 (Stand am 1. Juni 2015)

---

*Der Schweizerische Bundesrat,  
gestützt auf die Artikel 10 Absatz 4 und 39 Absatz 1 des Bundesgesetzes  
vom 7. Oktober 1983<sup>1</sup> über den Umweltschutz (USG)  
und den Artikel 47 Absatz 1 des Gewässerschutzgesetzes vom 24. Januar 1991<sup>2,3</sup>  
verordnet:*





# Ordinance on major accidents

## *Scope of application*



2'400 Chemical establishments



3'600 km railway lines



7'800 km main roads

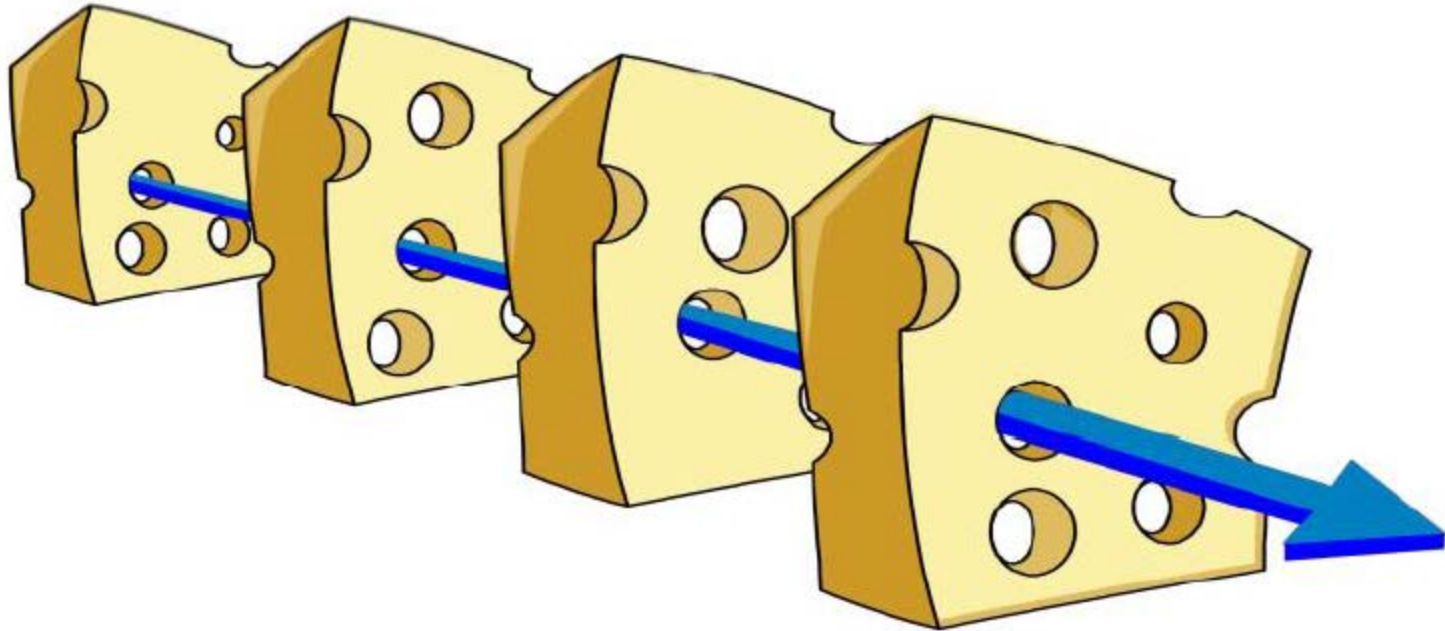


2'500 km gas and oil pipelines



# Ordinance on major accidents

*Deterministic and the probabilistic approach*



Prof. Dr. P. Bützer, Massnahmen zum Stand der Sicherheitstechnik bei hochaktiven Stoffen, 2013

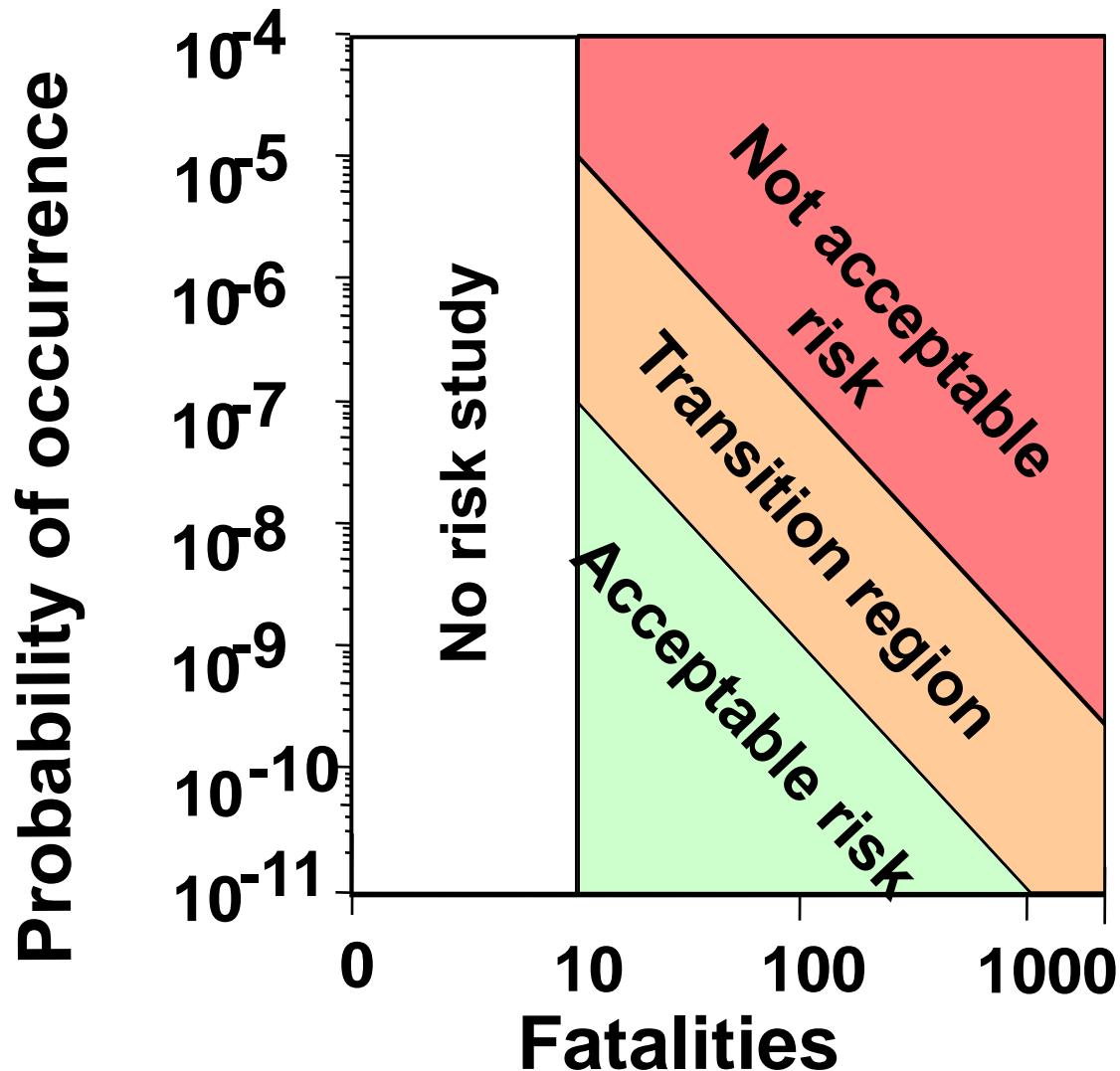
Deterministic approach: make the holes as small as possible

Probabilistic approach: Additionally close the holes on a line



# Ordinance on major accidents

*Probabilistic evaluation criteria*







# Ordinance on major accidents

*10 years after the Seveso Directive*

- Swiss Ordinance on major accidents entered into force in 1991 – about 10 years after the Seveso Directive
- Switzerland's regulations go one step further than the Seveso Directive or the Industrial Accidents Convention
  - Lower thresholds for chemicals, broader scope of application
  - Transport routes (railway lines, roads, river Rhine), gas and oil pipelines in the scope of application
  - Quantitative risk approach



## Germany (28)

## Austria (5)

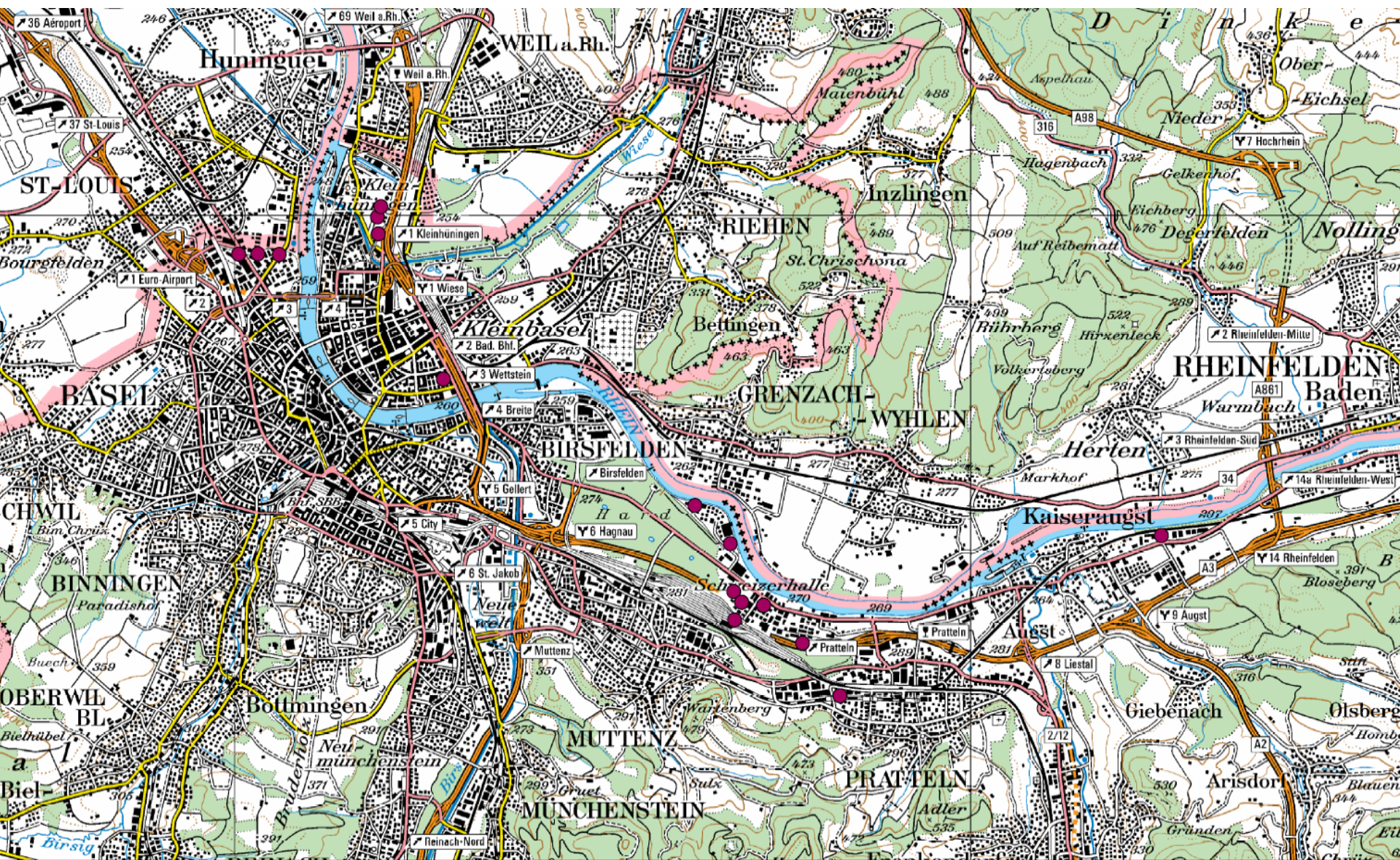






# Transboundary cooperation

## *Notification of hazardous activities*



30 years after the Sandoz accident – Lessons learned for preventing transboundary water pollution

Dr. Martin Merkofer, Federal Office for the Environment, Switzerland





# Transboundary cooperation

## *International Warning and Alert Plan Rhine*

- Rhine: Drinking water for approximately 22 million consumers
- 1987 it was decided that the International Warning and Alert Plan Rhine should be developed
- Seven alert centres between Basel and the Netherlands can transmit an alert downstream

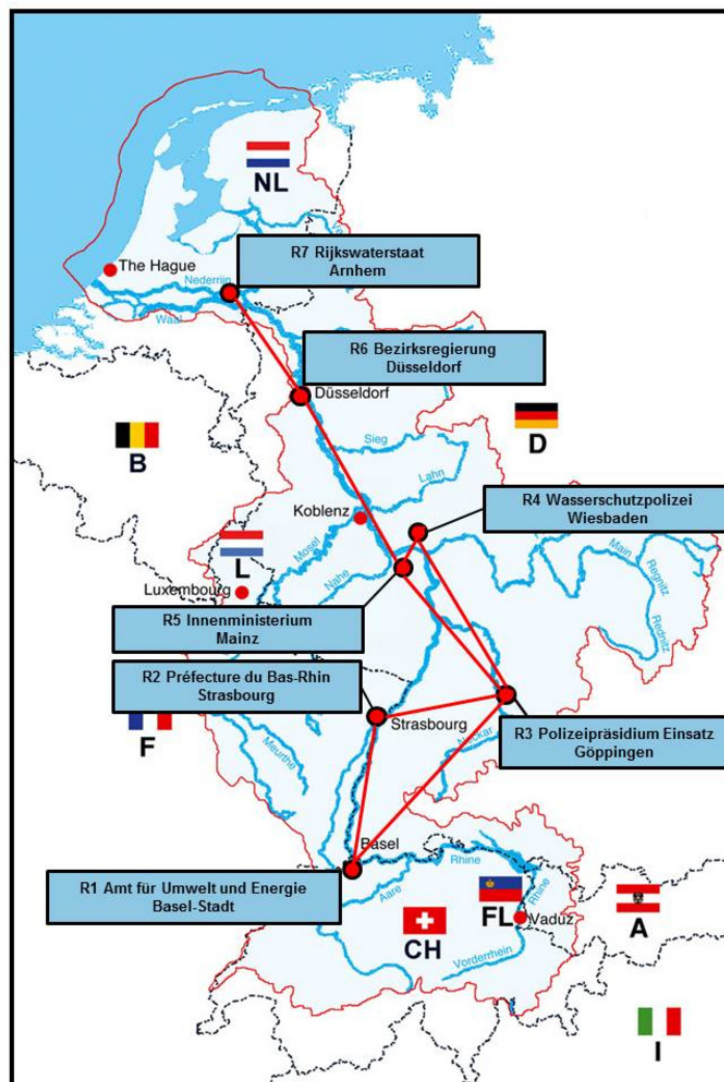
Monitoring station at Weil am Rhein in Germany, downstream of Basel





# Transboundary cooperation

## *International Warning and Alert Plan Rhine*



30 years after the Sandoz accident – Lessons learned for preventing transboundary water pollution

Dr. Martin Merkofer, Federal Office for the Environment, Switzerland





# Fire water retention strategy in Switzerland

## Guideline



## Löschwasser- Rückhaltung

Leitfaden für die Praxis



- Guideline developed by the cantons
- Objective: Avoid that extinguishing water contaminated with toxic chemicals can be discharged to surface waters
- The operators can save high follow-up costs with preventing measures
- Prevention measures can be:
  - Separate fire compartments which can withstand a fire for sufficient periods
  - Highly flammable substances should be replaced by less harmful ones or smaller quantities



# Fire water retention strategy in Switzerland

## *Fire water retention principles*



Stationary water retention basin



Mobile water retention basin (only as a supplementary possibility allowed)

The retention volume depends on the fire hazard of the substances stored, the fire compartment surface and the fire protection equipment. The guideline includes a formula to calculate the retention volume.



# Conclusions

- Prevention is better than response
- The ordinance established the basis for the cooperation between all of the parties involved
- The ordinance makes a crucial contribution to reducing the risks resulting from the handling and transport of dangerous goods
- Switzerland supports the work planned by the JEG to elaborate safety guidelines or best practices for fire-water retention

You will find more information in the following internet dossier elaborated by the Swiss Federal Office for the Environment

[Internet dossier 30 years after the Sandoz Accident](#)



# Thank you very much for your attention!

