



**Convention on the Protection and Use of Transboundary
Watercourses and International Lakes**

**Seminar on flood prevention, protection and mitigation
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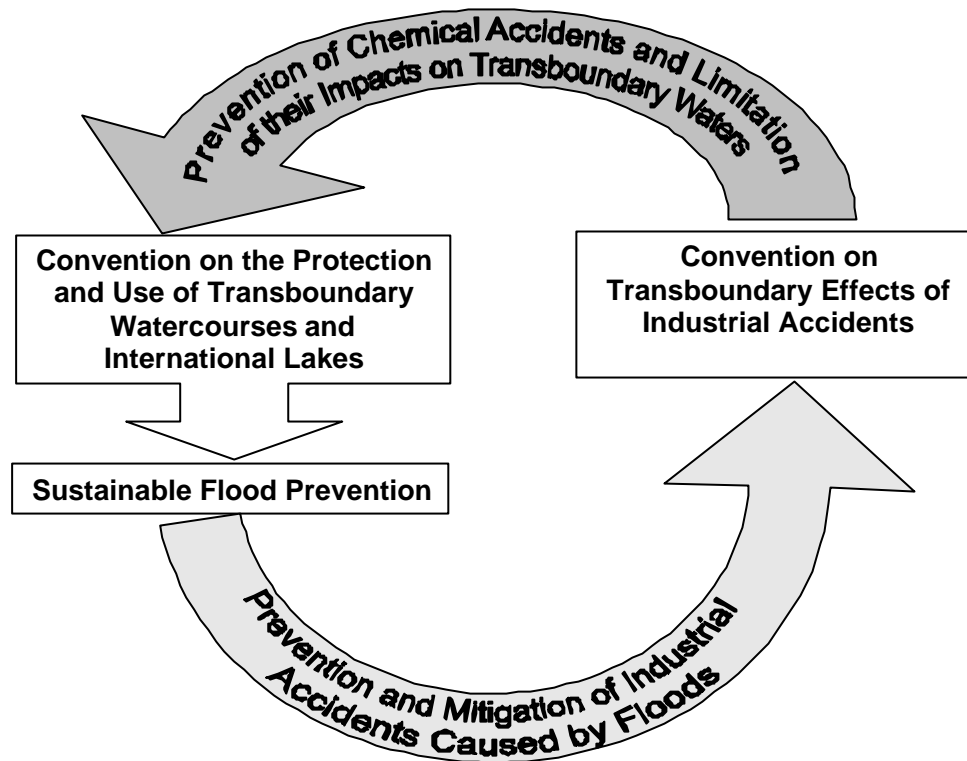
**UBA RESEARCH PROJECT ON PREVENTION AND MITIGATION OF
INDUSTRIAL ACCIDENTS CAUSED BY FLOODS**

Discussion paper transmitted by the Government of Germany¹

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1. Approach of the Project and links to the UN ECE Conventions



The prevention of, preparedness for and response to industrial accidents capable of causing transboundary effects are subject of the Convention on the Transboundary Effects of Industrial Accidents. Several subjects are covered by related implementation activities like accident notification, exchange of information on safety technology and management and civil liability. The joint expert group works on the prevention and mitigation of industrial accidents that may cause pollution of transboundary waters.

The prevention, control and reduction of pollution of transboundary waters are subject of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes. One related important subject is the sustainable prevention of floods. On the basis of the UNECE Guidelines on Sustainable Flood Prevention from 2000 elaborated the EU Commission recommendations on the Best Practice of Flood Prevention in 2003.

The UBA research project addresses the prevention and mitigation of industrial accidents, caused by natural impacts especially floods. The subject of accidents caused by natural disasters is within the scope of the Convention on Industrial Accidents according to its Art.2, but has to base on and is related to the flood prevention activities.

Therefore the findings of the project may help to link the subjects of both conventions in the other way than by the main approach of the joint expert group.

2. Links to the Activities of the Joint Expert Group

Of course the joint expert gave recommendations on subjects of the project as well and other results of the expert group are quite useful.

The long-term work program of the joint expert group addresses already the requirement to ensure that containers and parts of installation with substances hazardous to water are protected against buoyancy, avulsion and damage from floating material (item No. 8) and the consideration of flood risk in siting of hazardous installations (item no. 9).

The inventory of existing safety guidelines and best practices for the prevention of accidental transboundary water pollution includes already the recommendations for the prevention of

industrial accidents and safety of installations of the International River Commissions. Especially the recommendations of the International Commission for the Protection of the Elbe include already detailed technical requirements for the prevention of releases of hazardous substances in case of floods due to buoyancy, avulsion and damage from floating material.

3. Links to the Recommendation on Sustainable Flood Prevention and related Best Practices
The guidelines on sustainable flood prevention give already some quite helpful advice for the identification of hazards to installation by floods and required safety measures:

- ▶▶ Flash floods and riverine floods can thread installations.
- ▶▶ The kind and degree of these threats can change due to natural developments or human activities.
- ▶▶ Legislation like building codes or spatial planning should require that installations including hazardous substances are not sited in flood-prone areas.
- ▶▶ This requires clear flood maps and easily accessible information about restrictions on construction in flood prone areas.
- ▶▶ If nevertheless the siting there cannot be avoided or these installations exist in these areas they should be made flood-compatible.
- ▶▶ The existence of forecasting and early warning systems is essential to allow the required emergency response at these installations.

4. Subjects of the Research Project

The scope of the project is limited to

- a) establishments and installations, which are subject of the German Hazardous Incidents Ordinance, which implements the EU Seveso-II-Directive, and
- b) other installations for the handling of substances hazardous to water

on the one hand.

On the other hand the scope is limited to the prevention and mitigation of accidents caused by floods for both types of establishments or installations and caused by storm, earthquakes and subsidence by mining for type a) establishments and installations.

It has to be regarded that the scope of the project covers other kinds of consequences of accidents than the pollution of water.

Contractor of the project is Warm-Engineering in cooperation with Dr. Kröppke (engineering consultants), Krätzig and partners (civil engineers) and the institute for water management of the Karlsruhe University.

The specification of the project is structured in six main tasks:

Task one is the evaluation of hazards by floods. This task started with the identification of relevant, threatened establishments and installations for further fact-finding on site. The UBA has to thank the Länder North Rhine-Westphalia, Saxony and Saxony-Anhalt, which support the project and supported especially this identification and fact-finding on site. At the same time the contractors evaluated in cooperation with the competent authorities the kind and degree of past and actual flood risks for the sections of the Elbe and Rhine catchments area where these establishments and installations are located. Subject of ongoing evaluation is to what extent areas at risk due to failure of dikes are considered in flood risk maps and the existence of hazardous installations is considered in flood risk prevention and mitigation policies. Additionally the contractors have to compile the legal requirements, technical standards and recommendations on control of flood risks and control of risks of releases due to floods. Finally the contractors made surveys on site at establishments and installations threatened by flash floods in Saxony, threatened by riverine floods in North Rhine-Westphalia and Saxony-

Anhalt and one establishment threatened by earthquakes and storm in North Rhine-Westphalia. These surveys shall give information on problems with the implementation of legislation, standards, recommendations and other practical problems.

Task two is the evaluation of hazards by storm, earthquakes and subsidence caused by mining. The contractors shall evaluate how far kinds and degrees of effects by these hazards are considered in legal requirements and standards on one hand and in safety reports and licences on the other hand.

Task three is the evaluation to which extend hazards by floods, earthquakes and subsidence by mining are covered by the emergency planning of the operators of the relevant installations and the related risks by installations are considered in the contingency plans of the competent authorities.

Task four is the compilation of information on the state of the art in and options for retrofitting for the control of risks of releases of hazardous substances due to floods. This compilation shall cover measures to protect sites against flooding by siting, stationary or mobile technical equipment as well as measures to prevent or limit releases in case of flooding of the site. Because in the scope of the project are complex industrial installations this has to include the flood-compatibility of auxiliary safety relevant equipment like process control devices, energy supply, cooling water supply etc. The compilation shall include measures for emergency management in case of releases as well.

Task five is the evaluation of information on the state of the art in prevention of major accidents due to storm, earthquakes and subsidence by mining at establishments and installations that are subject of the German Hazardous Incident Ordinance. This evaluation shall cover adapted engineering and design practices as well as specialised construction technology. Additionally the contractor shall make suggestions on the improvement of related regulations and standards.

Task six is the set up of modules for the case of floods for emergency plans of operators of establishments and for contingency plans of authorities. This modules shall help to improve the coordination of both types of plans, the access of operators to forecasts and early warning systems, an appropriate choice of an emergency management strategy of the operators and an integration of the needs of operators of hazardous establishments in contingency plans of authorities.

The final report of the project shall be presented by the end of 2005.

5. First Draft Findings:

At the moment the contractors are working on task one to three of the project specification.

Some of the draft findings are:

- a) In case of floods the amount of hazards should not increase by releases of hazardous substances. In case of floods the possibilities to mitigate the impacts of these releases into water or air to man or the environment are less than in normal situation. Therefore risks and safety requirements of hazardous establishments and installations should be considered in flood prevention policies.
- b) The legal requirements, standards and recommendations concerning the prevention and mitigation of releases by floods should be harmonised. At the moment the policy approaches and requirements differ and make it difficult for operators to identify their obligations. Harmonisation of the approaches and recommendations especially those of the International River Commissions may help to harmonise legal requirements and technical standards.
- c) If the siting of hazardous installations in flood prone areas cannot be avoided it requires an evaluation of flood risks and requirements of flood protection and/or flood compatible design. These evaluations should be updated on a regular basis because the floods risks may change over time.
- d) The maps on flood plains and flood prone areas should be easily accessible for operators and authorities in charge for licensing or inspection of hazardous installations.
- e) The forecast and early warning systems should consider hazardous installations in flood plains and flood prone areas and provide specific information to the operators of these installations.
- f) The flood protection policies and the contingency planning of authorities for floods are focused on the protection of residential areas. The cooperation and communication between operators of hazardous installations and the authorities competent for flood prevention should be improved to identify and consider the specific risks and needs of these installations.
- g) Activities for flood risk identification for and control at hazardous installations should be included in flood control action plans and definition of risk reduction aims.