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Requirements for technical safety and for emergency planning arising from Seveso and Water Framework directives, results of a research project

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Project-title:

Strategies for implementation of the requirements of the Water Framework Directive under Article 11 (3) (L) for prevention and reduction of the effects of unforeseeable water pollution of industrial plants

www.alert-wfd.net

Duration: January 2007 – August 2009

On behalf of: German Federal Environment Agency

Institutes involved:

Hamburg Institute for Hygiene and Environment

University of Leipzig, Institute for Infrastructure and Resource Management

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Safety Obligations and Contingency Planning

according to the EU Water Framework Directive

- I. Introduction
- II. Project Results

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Germany as Part of River Basins in Europe

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Cyanide-Accident; Kolin, January 2006

Slajd 6

Press-Headlines:

- Wave of Poison Is Rolling towards Saxonia!
- Cyanide in the Elbe is endangering Drinking Water Supply in Germany!

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Oil-Storage Terminal Buncefield, UK

Slajd 8

Maps

Slajd 9

Damage Review & Hazard-Analyses

- Hazards could have been prevented by basic technical and organisational Safety Measures
- The impact of water accidents can be minimised with an efficient Contingency Planning

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Lessons learnt

Even small amounts of dangerous substances released into waters, can cause huge environmental damages,

as the impact is

- far-reaching and often
- transboundary
→ harmonised Riskmanagement

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Riskmanagement → Safety Chain

Feedback

- Hazard-Prevention
 - Basic Recommendations
 - Preventive Measures
- Crisis- Management

- Contingency Planning
- Response Measures
- After Care Management
 - Damage Review
 - Follow Up Measures

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Safety Obligations for waterendangering Installations

X - Water Risk Potential

Y - Number of Plants

Z - Safety Measures

- Special Safety Needs
- Safety Obligations
- Basic Safety Requirements

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Internal Factor: Fire

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External Factor: Earthquake

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External Factor: Floods

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- Basic Safety Requirements
 - WFD Safety Measures + Alarmsystems
- Safety Obligations
 - Seveso II- / IPPC-Dir. Safety Management + BRef
- Special Safety Needs
 - Seveso II Safety Report + Emergency Planning

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Operator Safety Measures

Authority Measure-Programme

Art. 11 (3) I Any (basic) measures

- to prevent significant losses of pollutants from technical installations, and
- to prevent and/or to reduce the impact Of accidental pollution incidents for Example as a result of floods
- including through systems to detect or give warning of such events
- including, in the case of accidents which could not reasonably have been foreseen, all appropriate measures to reduce the risk to aquatic ecosystems

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Operator Safety Measures

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Strategy: Integration and Comparison of the Obligations according to Art. 11, 3 (I) with Elements of the Safety Chain

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Risk Management – Safety chain

Feedback

- Hazard Management; Pro action; Prevention
- Crisis Management; Preparedness; Response
- Aftercare Management; Aftercare

- Area directed prevention; - sens. Areas (e.g. reservates, water use); - Equipment and Means for Combating
- Source directed prevention; - Safety Recommendations e.g. for Installations, Pipelines, TMF
- Preparing and performance; - Int. Warning and Alert Plans; - Monitoring Systems
- Effect directed performance; - Early Warning System; - Response Measures
- Evaluation; - Lessons learnt

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Hazard Management – Pro Action

Legal/ assessment basis

Bodies

Risk assessment

Inventories of potential sources

Inventories of objects of protection

Hazard paths

Hazardous substance; installations; contaminated sites ; location- specific potential sources

Utilities; ecology; other objects of protection

Spillage; dispersion; areas of risk

Involvement of the public

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Measures and Implementation examples

Hazard Management – Pro Action

Measure

- Reviewing/creating the necessary legal basis
- Reviewing/creating the necessary assessment criteria
- Reviewing/creating basic safety requirements
- Establishing/engaging competent institutions and bodies
- Analysis of potential hazards
 - Making inventory of risk sources with regard to
 - Substances
 - Plant location
 - Contaminated site location
 - Local safety hazards
 - Inventory of potentially affected objects of protection with regard to
 - Human use
 - Ecology
 - Other objects of protection
 - Assessment of risks with regard to hazard paths
 - Spillage
 - Dispersion
 - Areas of risk

Implementation examples

- Seveso Directive, IPPC Directive, Water Hazard Classes, Facilities Ordinance (VAwS)
- WFD, 2006/11/EG, Seveso Directive, REACH, GHS, Water Hazard Classes, EASE
- Recommendations FGK, BREF, Technical Rules, DVGW, VDI
- Expert groups (river basin commissions, national, international), industry associations, JRC
- ICPO – List of potentially hazardous plants
- ICPE – List of potentially hazardous plants
- ICPDR – potential accident risk spots
- ICPD - old contaminated sites
- Flood maps / Earthquake maps
- Land use maps, CORINE
- Protected area maps (water, nature)
- Implementation Art. 6 WFD: Register of protected areas
- GIS-based damage forecasting / modelling

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Hazard Management – Pro Action

Danube River Basin District
Map 8 – Potential Accident Risk Spots

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Hazard Management – Prevention

Prevention

- Area related measures
Technical instruments; land use planning; flood protection
- Plant related measures
Official: permit; control
Private: notification; risk analysis; safety management
- Involvement of the public

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Measures and Implementation examples

Hazard Management – Preventive Measures

Measure

- Provision of technical (planning) instruments
- Obligation to include the requirements of Article 11 (3) I WFD in regional-policy and land-use planning
- Area-related check for sensitivities and deficits, see Article 11 (3) I WFD
- Obligation on licensing authorities to include the requirements of Article 11 (3) I WFD in plant approval procedures
- Inspection and monitoring of plants with regard to implementation of and compliance with additional technical requirements resulting from Art. 11 (3) I WFD (inspection intervals)
- Encouraging/promoting voluntary measures at plant and higher Levels (“responsible care”)

Implementation examples

- Prevention planning software (VPS), pollutant spread models (**ALAMO**, data from UNDINE, for example)
- Land use planning (Seveso Directive)
- Implementation of Directive 2007/60/EC (EC Flood Directive) Flood action plans (see also UBA F+E 20348362)
- Approvals/conditions/prohibitions, ICPE and ICPR safety requirements; Check list method – Federal Environmental Agency
On-site checks; Reporting requirements; Reports by independent experts
Manual: Plant-related water conservation inspections (Hesse)
- Transport accident and assistance system (TUIS), VDI cooling water concept,

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Hazard Prevention

- Functional Units
- Risk Areas
- Branches

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Hazard Prevention

- Floods
- Safety against Floods

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Crises Management - Preparedness

Preparedness

- Early – warning systems
 - Organising
Local measuring stations; river basin measuring stations; on-site measuring device
 - Detection and assessment of incidents
Measuring points/ measuring stations/ measuring networks; alarm situations; forecast – and warning tools
- Warning and emergency plans
 - Warning – and alert technology
Local alert center and notification; international alert center and notification; notification by company
 - Warning – and alert criteria

- Immission – oriented; emission – oriented
- Protection planning
 - Stockpiling of technical equipment
 - Local; river basin; company
 - Responsibilities
 - Local; river basin; company
- Involvement of the public

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Measures and Implementation examples

Crisis management – Preparedness

Measure

- Design and establishment of immission-related (river-related) early warning systems
 - Establish of continuous measuring stations
 - Establish measuring and communication networks for entire river basin district
 - Develop/implement event identification technology and instruments for assessment and forecasting
- Design and establishment of emission-related (plant-specific) early warning systems linked to measurement and communication network for river basin
- Design and implementation of warning and emergency plans for the entire river basin
 - Establishment of warning and emergency centres
 - Definition and technical realisation of warning and emergency paths
 - Definition of emission-related and immission-related warning and emergency thresholds
- Design and implementation of disaster control plans, accident management plans etc.
- Provision of technical facilities and equipment for protective measures and damage containment
 - at public level
 - at plant level
- Ensuring readiness and functioning of crisis management instruments
 - at public level
 - at plant level
 - crisis communication (at all levels)

Implementation examples

- Early warning system Netherlands (Rhine/Maas), Water Surveillance System Hamburg (WGMN), EASE UNDINE, VPS, ALAMO Aqualarm (NL) TGD Surface Water Chemical Monitoring (EU Draft)
- Bayer, BASF
- Infra-web (NL) ; International warning and emergency plans of ICPE (Elbe), ICPD (Danube), ICPR (Rhine) ; EASE
- Regional disaster control plans, Hamburg oil control guidelines
- Police, plant fire brigade, THW, oil barriers, “Central provision, mutual assistance”
- QM, training, exercises for entire river basin district

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Dynamic Thresholds – Alarmindex

OK; Event; Alarm

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Int. Alarmplan „Elbe“
Int. Alarmplan „Rhine“

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Crises Management – Response

Response

- Alarm
 - Alarm management
- Reaction
 - Disaster assistance
 - Local scale; river basin scale; plant scale
 - Measures related to objects of protection
 - recovery
- Involvement of the public
 - Crisis communication

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German - Polish Response Exercise

8 September 2009

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Aftercare Management – Damage Review

Damage Review

- Official
 - Evaluation of safety management at factory level
 - Evaluation of official response
 - Assessment of damages
- Private
 - Analysis of reasons
 - Analysis of deficits
- Involvement of the public

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Aftercare Management – Follow-up

Follow – up to incidents

- Official
 - Consequences for hazard management
 - Consequences for crisis management
 - Monitoring
 - Recovery of the natural condition
- Private
 - Consequences at company level
 - Technological modifications; changes of organisation
- Involvement of the public

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Measures and Implementation examples

After Care – Damage Review + Follow-up Measures

Measure

- Creation of structures that ensure the following after an incident:
 - Official evaluation of plant-related safety management
 - Evaluation of official crisis management
 - Evaluation of impacts suffered
 - Analysis of plant-related causes and deficits
- Creation of structures that ensure incorporation of the analytical results (“lessons learnt”) in the fields of
 - Hazard prevention
 - Crisis management
 - Database creation

Implementation examples

- Guideline for registration, clarification and analysis of major accidents and disturbances of normal operation within the meaning of the Major Accidents Ordinance (LAI 2002), Concept for registration and analysis of safety-relevant incidents (SFK 1998) Workshops, Seminars
- Incident working groups in the international river basin commissions ; Zentrale Melde- und Auswertestelle (ZEMA/UBA) (Registration and analysis centre) ; Major Accident Reporting System (MARS/EU)

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Basic Measure Catalogue for River Basin Management Plans

1. Implementing **legal requirements for basic safety measures** in the field of hazard prevention and crises management (legal framework, assessment criteria, safety requirements) at hazardous facilities
2. **Analysis of potential hazards** (Inventory of risk sources and spots, potentially affected protective goods, risk assessment)
3. Integrating requirements of Art. 11 (3) I WFD within **land use planning** activities
4. Authority- and Operator-based **regular inspection systems** controlling safety measures compliance to Art. 11 (3) I WFD
5. Effective implementation of **International Warning and Alert-systems** (adjusted with emergency response action plans)
6. Establishing of **early warning systems** (*Monitoring Stations integrated in International Warning and Alert-Systems*)
7. Developing a **strategy of contingency planning** for the whole river basin (provisions of technical facilities and equipment and structures for responsibilities)

8. **Effective Feed Back Mechanism** - Creation of structures nationwide and for the whole river basin for damage review that ensure incorporation of "lessons learnt" in the fields of Hazard prevention and Crisis management

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WFD (Art. 11, 3 I) Basic Measures

- Hazard-Management
- Crisis-Management

Joint River Bodies Implementation of concrete - Measures

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Thank You for Listening