

ter Conventions⁷. Measures pursuant to these and other provisions that have already been implemented by obligation or on a voluntary basis would not require any additional regulatory action in the river basin management plan to satisfy Article 11 (3) I WFD and would therefore not have to be stated in it. To this extent Article 11 (3) I WFD is to be understood as a “review assignment” to detect and fill any remaining “legal loopholes that need closing” in a field of law that is already fairly extensively regulated. The intended purpose of this action concept is not to redefine or create new definitions for all conceivable and necessary measures for a functioning risk management system under the umbrella of a single paragraph of the Water Framework Directive, but merely to specify *additional* measures that, *solely on the grounds of Article 11 (3) I*, need to be incorporated in the programmes of measures for the management plans, though certain delimitation problems are unavoidable here.

3 Concept

Chapter 3 is intended to serve as a brief outline of the structure of the concept and the selection of proposed measures. It is inevitable that a number of questions will remain open. Further explanations can be found in Chapters 4 to 7. For more detailed discussion the reader is referred to the project report².

Proposed measures were drawn up on the basis of a risk management flow chart for the surface waters path (“Safety Chain”)⁸. The safety chain is based on a time schedule in 3 main categories, each with 2 sub-categories (Figure 1), from strategic preparation for the event through damage containment to after care. Figure 2 to Figure 7 show

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⁵ Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control, OJ L 257, 10.10.1996, p. 26ff, codified: Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control (codified version), OJ L 24, 29.01.2008, p. 8.

⁶ COUNCIL DECISION of 23 March 1998 on the conclusion of the Convention on the Transboundary Effects of Industrial Accidents (98/685/EC), OJ L 326, 03.12.1998.

⁷ COUNCIL DECISION of 24 July 1995 on the conclusion, on behalf of the Community, of the Convention on the protection and use of transboundary watercourses and international lakes (95/308/EC), OJ L 186 of 5.8.1995, p. 42.

⁸ The safety chain is not a rigidly defined concept. However, Figure 1 can be derived in this or similar form, e.g. from the structure of the UNECE Accidents Convention or the OECD Guidelines for Chemical Accident Prevention and Response. The further differentiation (Figure 2 - Figure 7) is an interpretation which the authors believe makes sense for work on this project, but which could be structured differently for addressing other problems.

the further differentiation of the “links in the chain” into more specific action levels with the aim of identifying individual measures of relevance to Article 11 (3) I WFD (Chapter 4 to 6). These suggested measures are allocated in tabular form to the categories of the safety chain (Table 2 - Table 5).

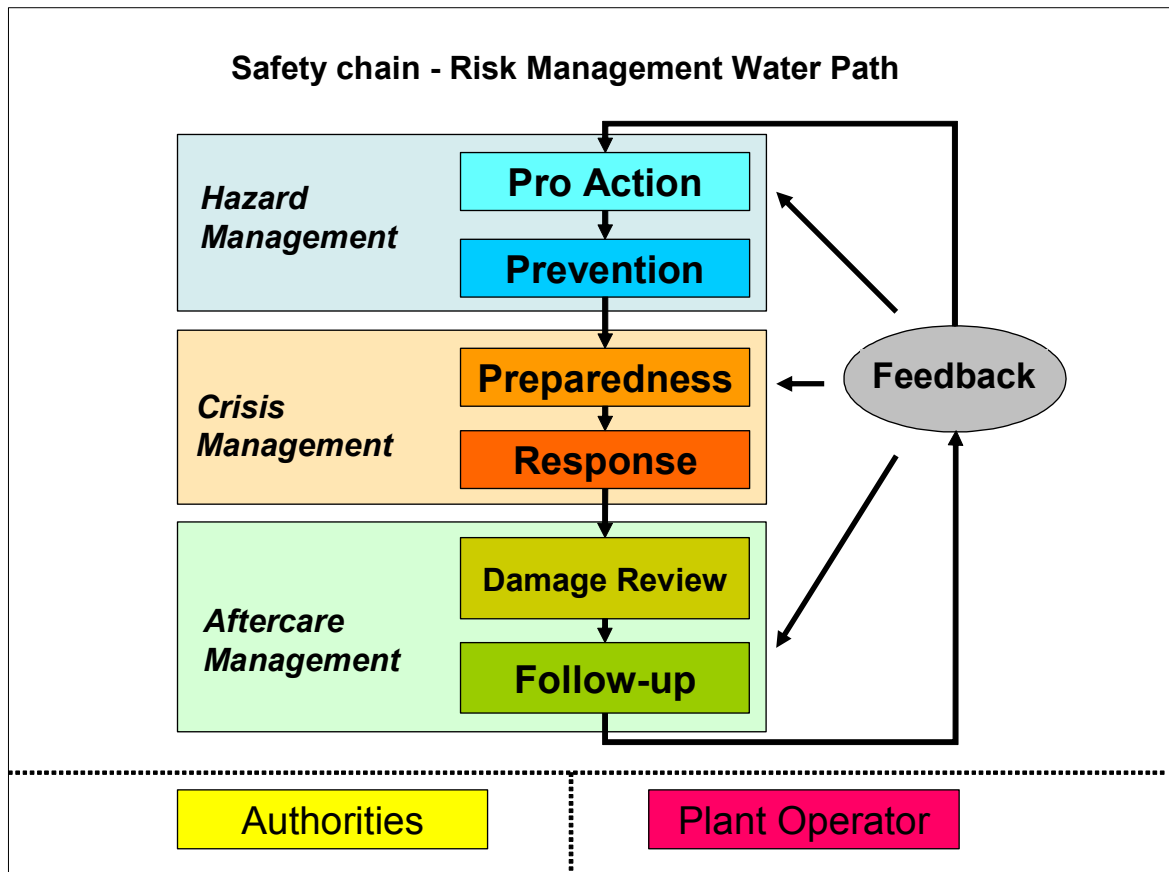


Figure 1 “Safety Chain” in risk management
(in the following schemes: authority tasks, operator tasks)

Whereas in principle – albeit in varying degrees of detail – the differentiated scheme of the safety chain claims to cover all essential risk management action fields in the surface waters path, this is expressly not true of the suggested measures. These should only name measures that can be deduced (solely) from Article 11 (3) I WFD. Measures that have been or ought to have been implemented under other Community water conservation provisions, such as the IPPC or Seveso II Directives, do not fall within the purview of Article 11 (3) I WFD and do not need to be mentioned in the management plan at this point.

sable for successful implementation of the proposed measures relating to Article 11 (3) I WFD. These are not only the “classic” water management administrations, which as a rule see to national implementation of the WFD with its primarily immission-oriented objectives, but also the emission-oriented authorities that are responsible for plant licensing/monitoring and accident prevention, plus the services that can be summed up under the heading of “disaster control”.

4 Hazard Precaution Management Measures

Hazard precaution management measures include all *strategic* measures

- ◆ to prevent and minimise the release of significant quantities of pollutants from technical installations and other potential sources, and
- ◆ to protect humans, animals, the environment, property and any other objects of protection in the event of accidents which could not reasonably have been foreseen.

The core of hazard precaution management consists of preparatory measures in the form of a specific analysis of requirements and risks, and measures to create necessary legal, planning and organisation structures (Pro Action).

On the basis of the structures created, the results of the analysis of requirements can then be used to implement strategic measures tailored to the specific river basin district to ensure a functioning crisis management system (prevention).

4.1 Basic Preparations (Pro Action)

For the purpose of implementing specific measures in the field of crisis management, it is necessary to identify and assess the possible hazards and to create the legal and organisational requirements for enforcing risk minimisation and crisis management measures at authority and plant operator level.

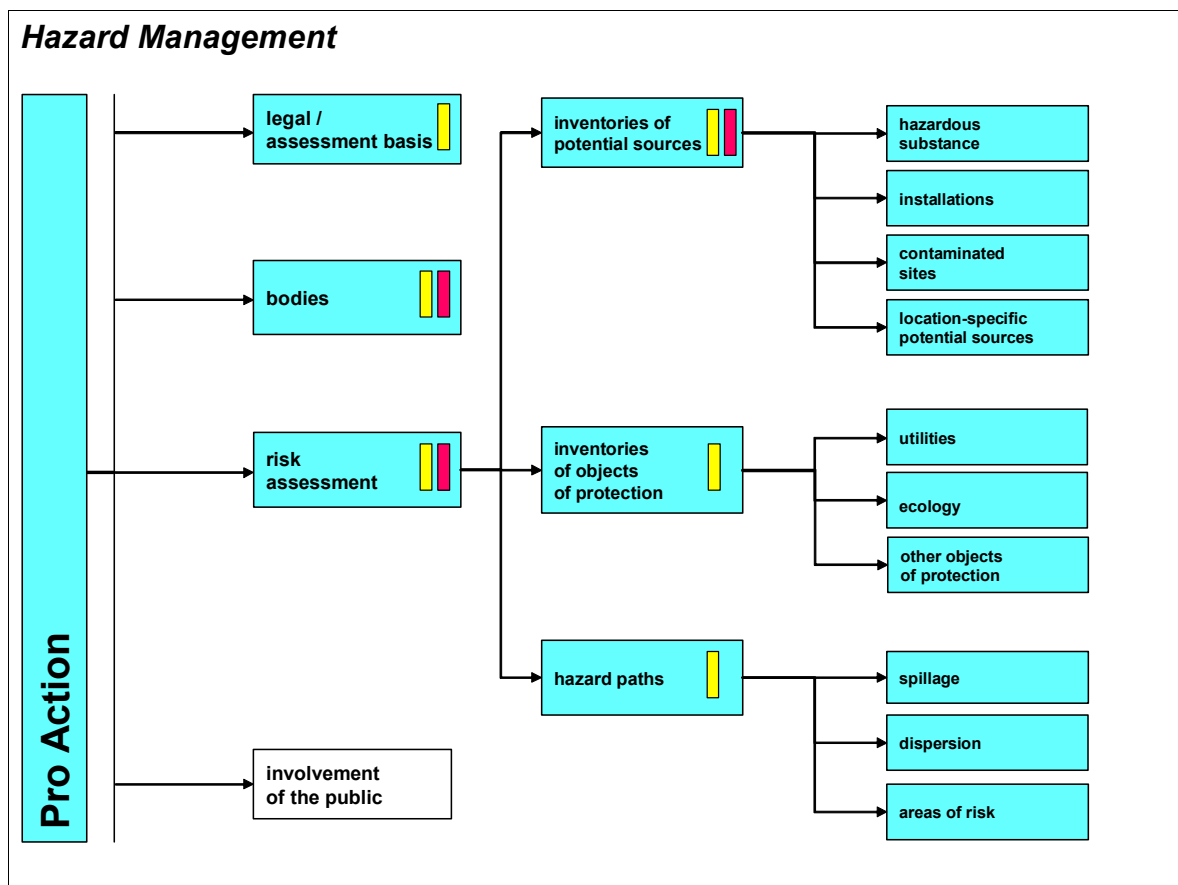


Figure 2 Hazard Precaution Management – Basic Preparations
(Authority tasks, Operator tasks)

Table 2

Hazard Precaution Management – Basic Preparations (Pro Action)	
Measure	Implementation examples
Reviewing/creating the necessary legal basis	Seveso Directive, IPPC Directive, Water Hazard Classes, Facilities Ordinance (VAwS)
Creating the necessary assessment criteria	WFD, 2006/11/EG, Seveso Directive, REACH, GHS, Water Hazard Classes, EASE
Reviewing/creating basic technical safety requirements	Recommendations of river basin commissions, BREF, Technical Rules (DVGW, VDI)
Establishing/engaging competent institutions and bodies	Expert groups (river basin commissions, national, international), industry associations, JRC
Analysis of potential hazards <ul style="list-style-type: none"> • Making inventory of safety hazards for <ul style="list-style-type: none"> ○ Substances ○ Plant location ○ Contaminated site location ○ Local safety hazards • Inventory of potentially affected objects of protection with regard to <ul style="list-style-type: none"> ○ Human use ○ Ecology ○ Other objects of protection • Assessment of risks with regard to hazard paths <ul style="list-style-type: none"> ○ Release of substances ○ Dispersion ○ Areas of risk 	ICPER – list of potentially hazardous plants ICPDR – potential accident risk spots ICPDR - old contaminated sites Flood maps / Earthquake maps Land use maps, CORINE Protected area maps (water, nature) Implementation of Art. 6 WFD: List of protected areas GIS-based damage forecasting / modelling

4.2 Prevention

Prevention measures should, on the basis of the assessment of “basic preparations”, comprise those measures which ensure that crisis management is tailored to the specific conditions of the individual river basin district. A distinction is made here between district-related and plant-related measures. Crisis management must have at its disposal both technical (planning) instruments and precautionary measures of an organisational, constructional or plant-specific nature.

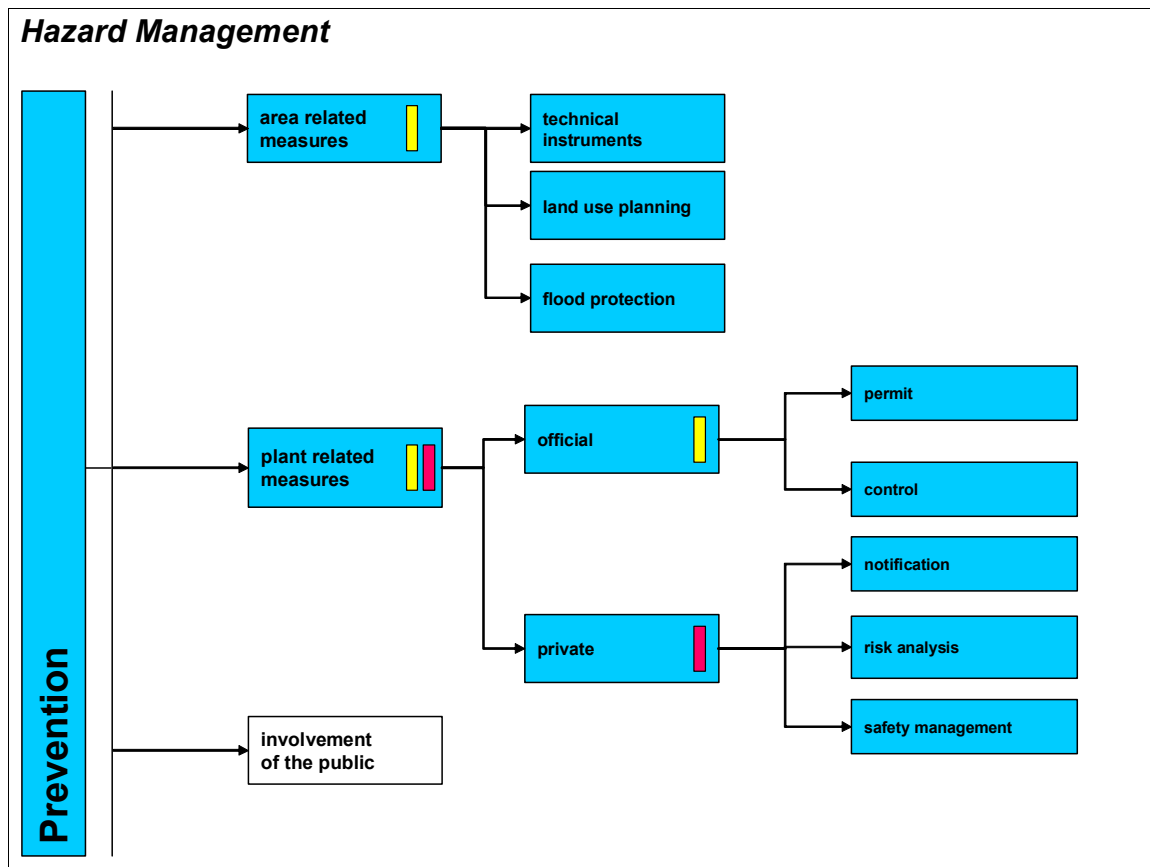


Figure 3 Hazard Precaution Management – Preventive measures (Prevention)
(■ Authority Tasks, ■ Operator Tasks)

Table 3

Hazard Precaution Management – Preventive Measures (Prevention)	
Measure	Implementation examples
Provision of technical (planning) instruments	Precautionary planning software (VPS), pollutant spread models (ALAMO, data from UNDINE, for example)
Obligation to include the requirements of Article 11 (3) I WFD in regional-policy and land-use planning	Land use planning (Seveso Directive)
District-related check for sensitivities and deficits, see Article 11 (3) I WFD	Implementation of Directive 2007/60/EC (EC Flood Directive) Flood action plans, UBA F+E 20348362
Obligation on licensing authorities to include the requirements of Article 11 (3) I WFD in plant approval procedures	Approvals/conditions/prohibitions
Inspection and monitoring of plants with regard to implementation of and compliance with technical requirements resulting from Art. 11 (3) I WFD (inspection intervals)	Safety requirements of ICPE and ICPR, Checklist method – Federal Environment Agency, On-site checks Reporting requirements Reports by independent experts Manual on performing in-plant water conservation inspections (Hesse)
Encouraging/promoting voluntary measures at plant and higher levels (“responsible care”)	Transport accident and assistance system (TUIS), VDI cooling water concept

5 Crisis Management

This section on “crisis management” covers the range of measures from “preparedness” to “immediate response”, and is subdivided primarily into the sections on “Instruments for preparedness” and the actual “Response to a specific event”. Crisis management will only function efficiently if hazard precaution management has created a viable structural foundation.

5.1 *Crisis management instruments (Preparedness)*

To ensure “preparedness” it is necessary to create both a technological and an organisational basis.

The starting point of global environmental law is the ban on transboundary environmental damage under Principle 21 of the Stockholm Declaration of 1972¹⁰, which obliges (initially western) states to ensure that no damage is caused to the environment in other states or regions outside their national territory by activities within their national jurisdiction. This in itself can be construed to represent an obligation to give warning, at least in the case of serious transboundary accidents. At the 1992 conference in Rio, this principle was confirmed in Principle 2, and the obligation to provide information and warning was explicitly incorporated (Principles 18 and 19).¹¹ As a result of the new aspect of the WFD that bodies of water are no longer managed within the boundaries of administrative regions, but at the level of river basin districts, the “transboundary character” (e.g. of water pollution due to accidents), which is otherwise so important in in-

¹⁰ http://www.unep.org/Law/PDF/Stockholm_Declaration.pdf

¹¹ http://www.unep.org/Law/PDF/Rio_Declaration.pdf

Principle 18: “States shall immediately notify other States of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those States. Every effort shall be made by the international community to help States so afflicted.”

Principle 19: “States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse transboundary environmental effect and shall consult with those States at an early stage and in good faith.”

ternational law, is relegated to no more than secondary importance, at least within the Community of the EU Member States.

All EU provisions^{4, 5, 6, 7} on accident prevention mentioned in the introduction (Chapter 2), and also a large number of conventions of the river basin commissions, lay down information and warning requirements. This resulted in the compilation of *warning and emergency plans* in many river basins long before the entry into force of the WFD. One frequent deficit is that only the emission-oriented path, namely notification by the polluter, is regulated.

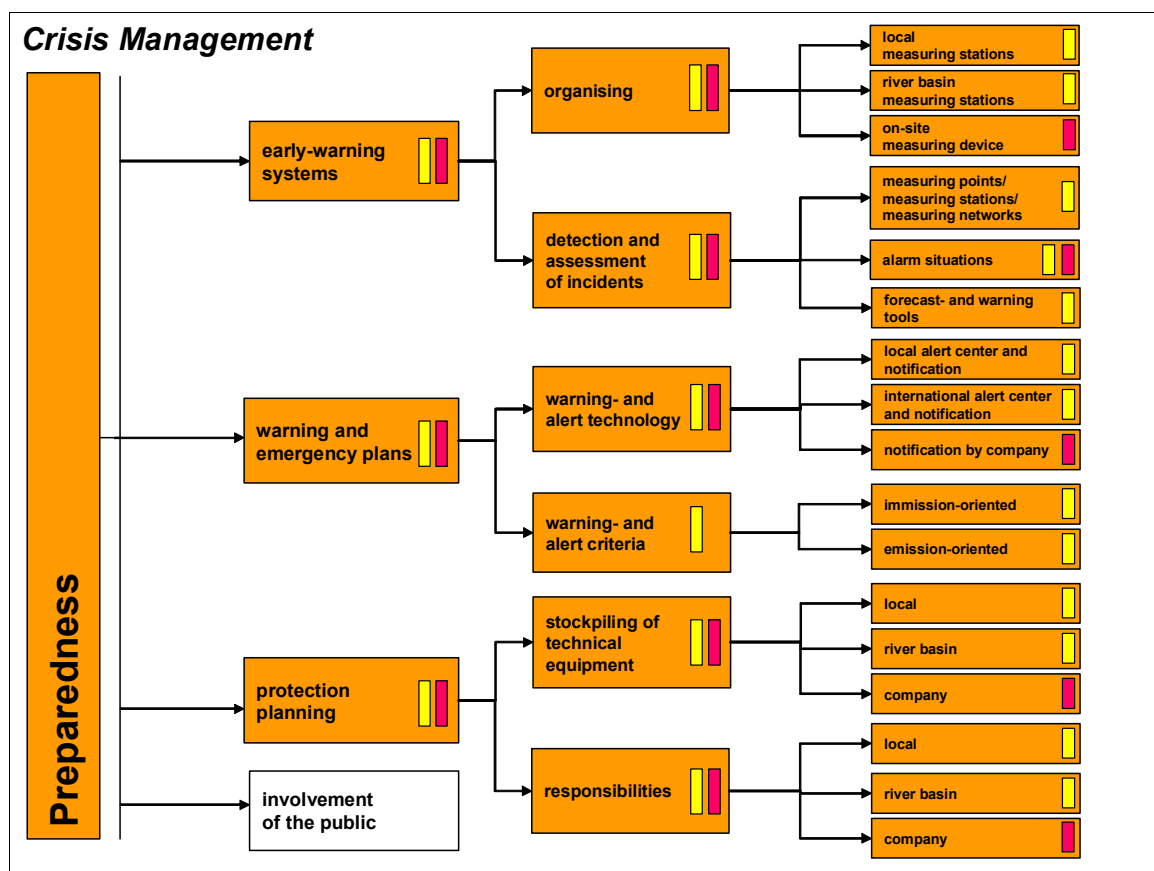


Figure 4 Crisis Management – Instruments (Authority tasks, Operator tasks)

The requirement in Article 11 (3) I WFD to use (technical) *systems for timely detection and early warning* is new to international law-making in this explicit wording, although it is virtually indispensable where warning and emergency plans take account of the immission path, and could therefore have been justified on the basis of older provisions.

The field of *protective planning* has existed in various forms and organisations since people in their habitats have been afflicted by “extraneous disasters” (not only via the water path) and have tried to prepare for such events. Certainly no essentially new principles for this have to be deduced from Article 11 (3) I WFD. However, the preparation of programmes of measures is good reason to review the suitability of the existing structures.

Table 4

Crisis management – Crisis management instruments	
Measure	Implementation examples
<p>Design and establishment of immission-related (river-related) early warning systems</p> <ul style="list-style-type: none"> • Establishment of continuously operating monitoring stations • Establishment of monitoring and communication networks for entire river basin district • Development/implementation of event detection technology, evaluation and forecast instruments 	<p>EASE, Water Surveillance System Hamburg (WGMN Hamburg), Early warning system Netherlands (Rhine/Maas), UNDINE, VPS, ALAMO Aqualarm (NL), Guidance for Chemical Monitoring under the WFD (EU Draft)</p>
<p>Design and establishment of emission-related (plant-specific) early warning facilities linked to the monitoring and communication network for the river basin</p>	<p>Seveso-II plants, e.g. Bayer, BASF</p>
<p>Design and implementation of warning and emergency plans for the entire river basin</p> <ul style="list-style-type: none"> • 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 	<p>Infra-web (NL) International warning and emergency plans of the ICPER (Elbe), ICPDR (Danube), ICPR (Rhine) EASE</p>
<p>Design and implementation of disaster control plans, accident management plans etc.</p> <p>Provision of technical facilities and equipment for protective measures and damage containment</p> <ul style="list-style-type: none"> • at public level • at plant level 	<p>Regional disaster control plans, □ Hamburg oil pollution control rules Police, plant fire brigade, THW (Federal Agency for Technical Relief), oil barriers, “Central provision, mutual assistance”</p>
<p>Ensuring readiness and functioning of crisis management instruments</p> <ul style="list-style-type: none"> • at public level • at plant level • crisis communication (across all levels) 	<p>QM, training, exercises for entire river basin district BMI Guidelines on “Crisis Communications”</p>

5.2 Response measures

This link in the safety chain is concerned with the measures that are implemented or have to be implemented in the event of a specific incident. These measures include the process of giving the alert, plus the immediate responses such as damage containment, measures to protect uses and other objects of protection, and also immediate damage remediation.

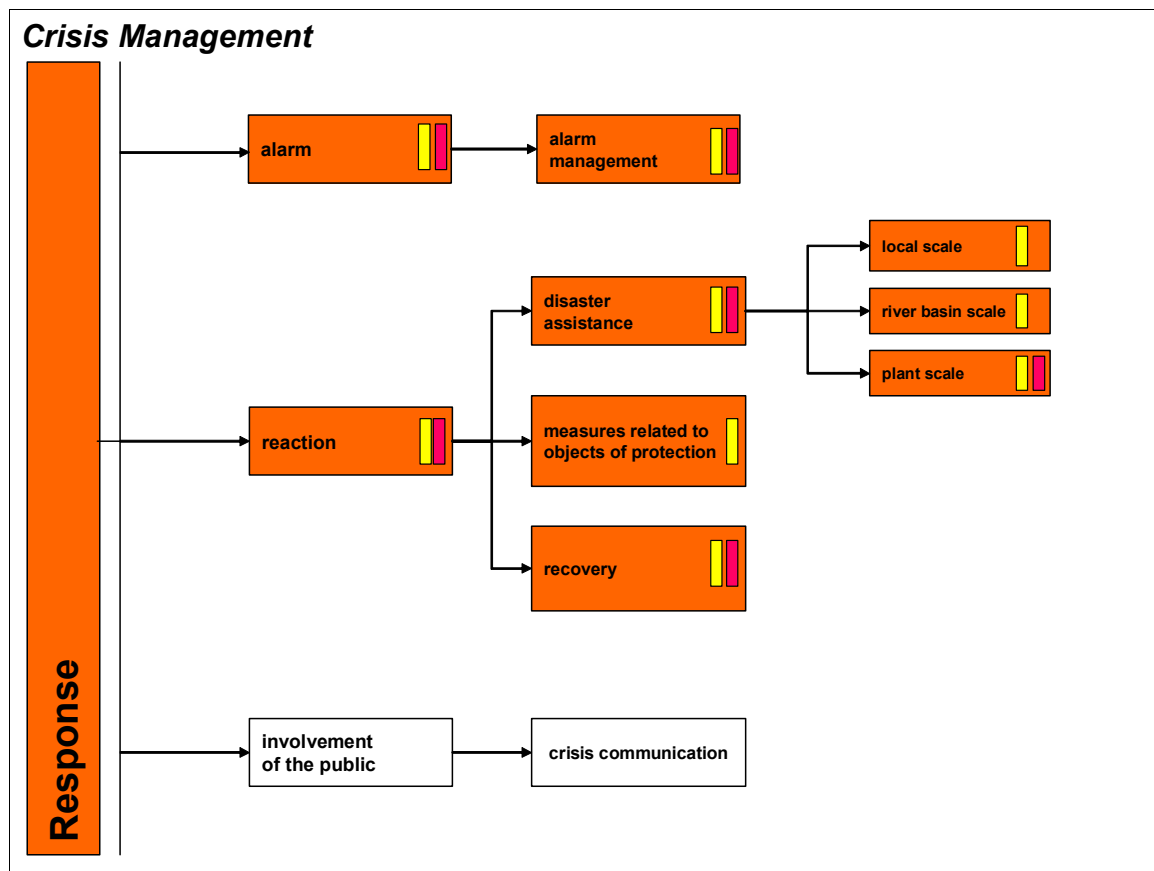


Figure 5 Crisis Management – Response Measures (■ Authority tasks, ■ Operator tasks)

The measures that have to be set in motion for a specific incident may involve the mobilisation of massive human and material resources in the individual case. In the strict sense, they are not management planning measures. Their prospects of success do however depend to a very large extent on the quality of the design and implementation of the preceding packages of “hazard management” and “preparedness” measures.

6 After Care

The field of after care covers all measures that follow immediate damage remediation. A distinction is made between “Damage review” and “Follow-up measures”.

The purpose of the analytical “damage review” is

- ◆ to help the authorities and the plant operator to prevent future incidents of the same kind or at least mitigate the consequences, and
- ◆ to estimate and assess the extent of the damage.

The field of “follow-up measures” is concerned with the measures that need to be deduced from the results of the review.

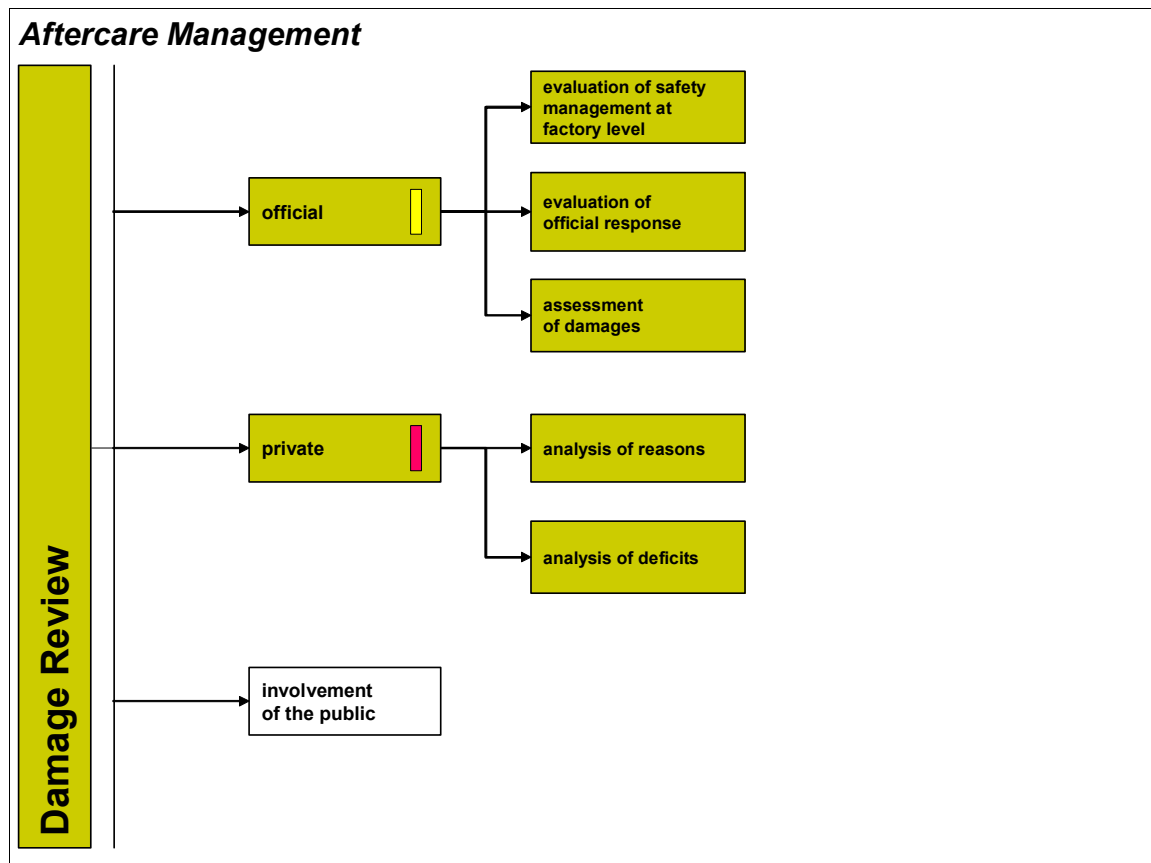


Figure 6 After Care – Damage Review (Yellow: Authority tasks, Pink: Operator tasks)

This handling is also of importance with regard to “*accidents which could not reasonably have been foreseen*”, which are mentioned in Article 11 (3) I WFD. Following occurrence and control of such an event it is important to check whether the classification of

“unforeseeability” can be sustained with regard to future events of the same type. If not, suitable measures must be taken. In the event of confirmation the WFD, in connection with possible failure to achieve the environmental objectives, allows the exceptional situation of a temporary deterioration of status as a result of “*circumstances ... which are exceptional or could not reasonably have been foreseen, in particular extreme floods and prolonged droughts and ... accidents*” (Art. 4 (6)). However, the barriers to claiming exceptional situations are high. Extensive justifications are required in the management plan, and steps must be taken to prevent further deterioration and to restore the original state. It is also necessary to establish the conditions under which one can claim circumstances which are exceptional or which cannot reasonably be foreseen, and the indicators that are to be used for this purpose. The impacts must be reviewed regularly (annually).

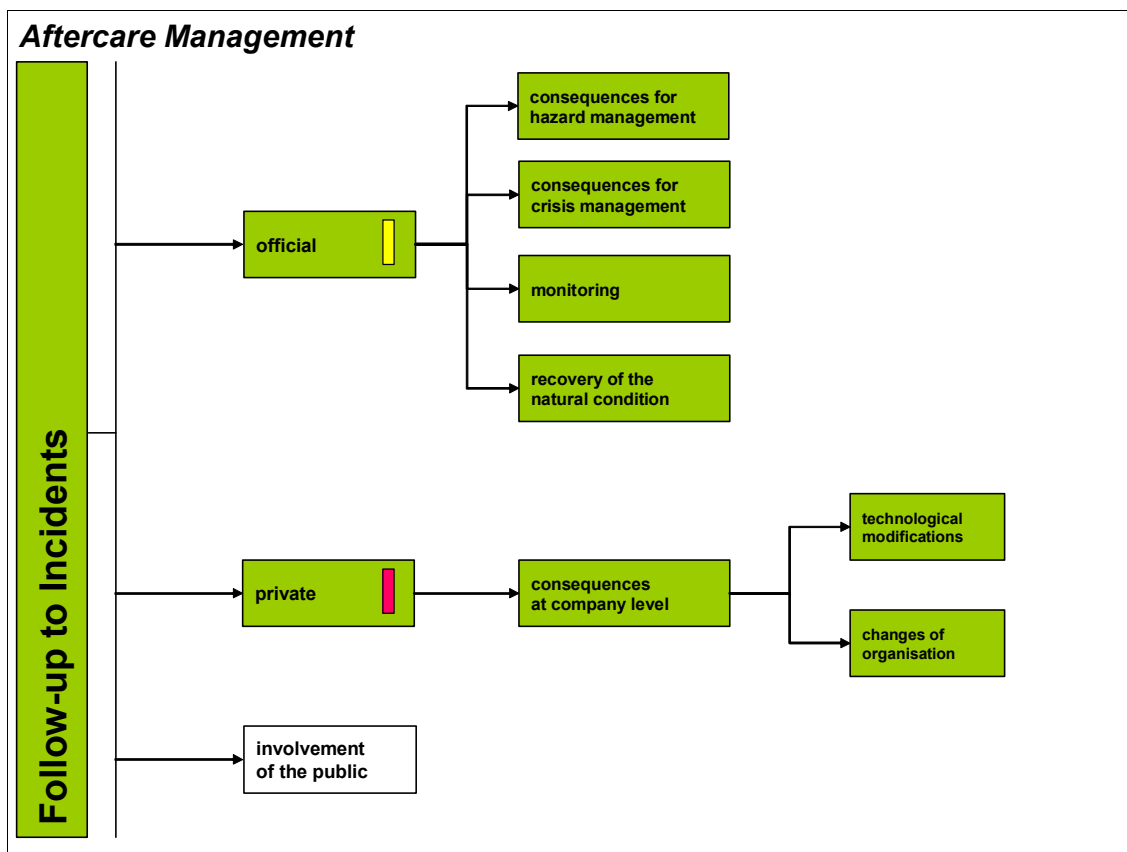


Figure 7 After Care – Follow-up Measures (■ Authority tasks, ■ Operator tasks)

The “material” after-care measures in the safety chain, such as repairing damage (e.g. to buildings and dykes), restoring the original state (e.g. in contaminated protected ar-

eas) etc., are not covered by the precautionary provisions of Article 11 (3) I WFD. The focus here is on damage review in the sense of checking the quality of the Pro Action measures up to the response, and ensuring that any deficits identified are remedied in future (lessons learned).

Table 5

After Care – Damage Review + Follow-up Measures	
Measure	Implementation examples
<p>Creation of structures that ensure the following after an incident:</p> <ul style="list-style-type: none"> • Official evaluation of plant-related safety management • Evaluation of official crisis management • Evaluation of impacts suffered • Analysis of plant-related causes and deficits 	<p>Guideline for registration, clarification and analysis of major accidents and disturbances of normal operation within the meaning of the Major Accidents Ordinance (LAI 2002),</p> <p>Concept for registration and analysis of safety-relevant incidents (KAS/SFK 1998)</p>
<p>Creation of structures that ensure incorporation of the analytical results (“lessons learned”) in the fields of</p> <ul style="list-style-type: none"> • Hazard prevention • Crisis management <p>Database creation</p>	<p>Incident working groups in the international river basin commissions</p> <p>(<u>Z</u>entrale <u>M</u>elde- und <u>A</u>uswertestelle (ZEMA/UBA) (Registration and analysis centre) <u>M</u>ajor <u>A</u>ccident <u>R</u>eporting <u>S</u>ystem (MARS/EU)</p>