

## ICPE recommendations on the basic structure of safety reports concerning hazards to water

### 1. Brief characteristic of the vicinity of the company

The followings should be described from the aspect of their hazard to water:

- Surface water and groundwater in the area, conductors of surface water and groundwater;
- Traffic connections and waterways;
- Existing plants/facilities for the treatment/transporting of potable water or industrial water;
- Pipes and wastewater systems in the vicinity of the plant;
- Identified water preservation areas;
- Other special environmental conditions, e.g. old improperly disposed waste, refuse disposal sites.

### 2. Description of hazardous substances

The following details must be provided for substances hazardous to water:

- Existing substances hazardous to water (chemical name, trivial name, UN NO., CAS NO.), overview of the substances that could potentially be formed as a result of the chemical reactions in case of accidents;
- Amounts and conditions of the existing/produced substances, particularly:
  - The amounts of substances handled in the plant/plant units that could be released at the simultaneously.
  - Pressure, temperature, concentration, physical state;
- Material data of the existing substances, particularly:
  - general physical material properties of the substances such as the melting temperature, boiling point, vapor pressure, density, solubility,
  - Safety-related material data such as flammability, reactivity with water, decomposition temperature;
- Water Hazard Classes and an evaluation of their:
  - Acute toxicity with respect to any danger for human use of the respective water resources and the functionality of the aquatic eco-system;
  - Long-term or late commencement of any danger for human use of the respective water resources and the functionality of the aquatic eco-system;
  - Details of the hydrolytic behavior and further reactivity of the substances with water under natural conditions;
- Existing data on substances that may potentially be formed by reactions.

### 3. Description of the plant and processes

Descriptions of the technical purpose of the plant, its basic structure and design as well as the fundamentals of the engineering process are the basis for any evaluation of the environmental risk from the plant and processes. The following are to be explicitly noted from the aspect of their hazard to water:

- Processing conditions, as far as they are in direct connection to existing/produced water-polluting substances;
  - Supply and disposal of substances to and from the plant (auxiliary materials, wastewater, residual substances, waste);
  - Stipulation of safety-relevant plant units (with due consideration of the precautionary principle):
    - Plant units handling special material content,
    - Protective and safety facilities,
    - Other plant units relevant to operational safety;
  - Description of safety-related plant units (with due consideration of the precautionary principle), in particular:
    - Design features, design of the safety-related plant units,
    - Presentation of the process, process conditions, physical or chemical conversions,
    - Functions and reliability of the safety-related facilities for gauging, controlling and regulating the process.
4. Identification and analysis of possible accidents and means of preventing them (hazard analysis)

The following are to be identified and analyzed from the aspect of their hazard to water:

- Examination of the safety management applied with respect to the handling, treatment, usage, storage, filling and transshipment of water-polluting substances, to ensure a high level of safety for both humans as well as the environment (organizational structure, areas of responsibility, behavior, methods, processes and means of, as well as the existing and/or planned monitoring systems);
  - Systematic survey of the safety-related plant units,
  - Assumption of a scenario in which the largest possible amount of the active content of a plant unit is released within the plant vicinity, estimation of the possible damage to humans and the aquatic environment;
  - Description of the soil layers and consideration of the possible spread of water-polluting substances in the ground;
  - Working out of hypothetical accident scenarios:
    - The circulation as well as the spread of substances in surface waters and groundwater currents, with attention to the interactions with other plants and plant units as well as the domino effects;
    - Examination of the effects on the water path,
    - Determination of the interfaces of organizational measures for hazard control planning;
  - Specification of priorities for the organizational and technical precautions and measures to be taken on the basis of the results of the hazard analysis.
5. Protective measures and emergency measures for preventing accidents and limiting damages

With regards to hazards water, precautions and measures should be stipulated to prevent accidental contamination or pollution:

- Identifying and avoiding the release of water-polluting substances into surface waters, into the ground and into the groundwater:
  - Wastewater system (plants for collecting, transporting and treating wastewater);
- Collecting and retaining systems in storage facilities, filling and transshipment of water-polluting substances on land and at sea:
  - Reporting and gauging systems (wastewater system, collecting and retaining system);
- Improving safety management and staff training/education:
  - Safety organization,
  - Publishing updated internal emergency plans (alarm and preventive measures/safety plans);
- Fire and explosion prevention:
  - Containment of fire-fighting water,
  - Protective zones,
  - Safety gaps;
- Protective facilities provided to counteract the effects of dangerous natural occurrences on plants handling water-polluting substances:
  - Protection against lightning,
  - High water,
  - Extreme weather conditions,
  - Earth-quakes;
- Incidents occurring in the vicinity and affecting the plants or plant units handling water-polluting substances.

## 6. Results

The results of the survey should establish that, there is no cause for concern in the event of an accident as far as hazards to water is concerned. The followings should be implemented:

- Evaluate the present safety level of the plant;
- Where applicable, identify remaining hazards, and
- Specify short, medium and long-term precautionary measures for them.