

**Environmental Accidents
Emergency Response Guide III**

OPERATIONAL SUPPORT

SUMMARY



**RIVER SHIELD 5D189
INTERREG III B CADSES**



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1. Preface

This Emergency Response Guide to environmental accidents was compiled in the framework of the “River-Shield” project, which is co-financed by the INTERREG IIIB CADSES program under the reference number 5D189.

The project’s objective is the protection of rivers from accidental industrial pollution. It is implemented in cooperation of environmental associated bodies from Greece, Hungary, Poland, Czech Republic, Slovenia and Bulgaria.

River-Shield is consisted of experience exchange, know how transfer and dissemination activities. During this process outputs like: good practice guides and conclusion reports are created. The main project activities and deliverables are presented at the www.rivershield.org web page.

Three emergency response guides for accidental industrial pollution that threatens mainly river areas were created. The first one is about emergency Preparedness and Response, the second about special Pollution Control Techniques and the third about Operational Support.

These Emergency Response Guides mostly provide general guidelines to public services and security forces that are involved in the response to major environmental accidents. They were compiled under the supervision of the Greek partners. Therefore the conditions presented correspond better to the Greek emergency response status. However conditions in the other EU member states are not that different.

Whatever is mentioned in the guides and in general at all the project deliverables and activities represent the views of the River-Shield partners and not in any way of the European Commission, which simply co-finances the project through the INTERREG IIIB CADSES program initiative.

2. Temporary Waste Storage

An industrial accident may lead to the leakage of dangerous chemical substances in the environment. For this reason temporary storage of the polluting elements is necessary.

The selection of the location of the temporary storage area depends on the area morphology, the access of transport means, as well as the form of its environmental protection.

The type of the temporary storage substructures depends on the quantity and type of the pollutant, the time of the temporary storage, the existence of other polluted materials.

Temporary cesspits, inflatable deposits, big plastic bags, barrels or trucks can be used as temporary storage.

In case the oil leakage affects water receptors or the collected material has to be transferred by waterways, then the use of vessels is recommended. The common vessels used for temporary storage are small boats (John Boats), with a volume equal to 2 m³. They offer plastic covers as accessorial equipment, they are portable and easily available.

3. Response Waste Management

In order to reduce waste generated during the response to an industrial accident, the following must be taken into consideration:

- The use of the response means should be conservative.
- Equipment and spill fighting means should be suitable to be used repeatedly
- The use of expendable materials and detergents should be reasonable.
- On-site waste treatment should be encouraged.

For solid waste it is recommended to follow the rules:

- ✓ Not to mix oily waste with others.
- ✓ The area where oily waste is treated or stored must be protected with plastic covers.
- ✓ When soil, that has been polluted, is collected, then the net quantity of the substance that is being collected at the same time must be as small as possible.
- ✓ Identifying the source of the waste, before its final disposal, is necessary.

For liquid waste it is recommended:

- ✓ The whole amount of chemicals stored in vessels should be utilised.
- ✓ All vessels should be covered in order to prevent rainwater from accumulating.
- ✓ Biodegradable chemical detergents should be preferred to neutralize the waste.
- ✓ In order to clean polluted materials, water should be used reasonably.
- ✓ The unspecified waste should be kept away until they are identified.

Operational Procedure

■ Collection

Waste separation takes place at source. The oily solid waste is collected in transparent plastic bags in order to check their content. The non-oily solid waste is collected in opaque, coloured bags. The middle-sized solid waste is led to waste tanks, while liquid waste is collected in vessels or barrels. Dangerous / toxic waste should not be mixed with non-hazardous waste. Waste with doubtful origin should be collected as dangerous.

■ Detection and Labelling

The type of the waste, the way and location of its transfer and the possible dangers to humans and the environment should be written on the waste packages.

■ Temporary Storage

■ Transfer

The environment must be protected during the transfer of the waste. Simultaneous shipment of oily and non-oily waste should be avoided.

■ Final Disposal and Treatment

The oily liquid waste is led to certain installations in order to separate the pollutant (e.g. petroleum) from other materials. The oily solid waste can be transferred to installations which have legal substructures for final disposal and treatment.

4. Response Training

In order to respond on time and successfully to a serious industrial accident systematic training is needed.

The basic issues of an educational program are:

- ✓ Fast Reaction and Response Techniques.
- ✓ Health and Safety.
- ✓ Use and Maintenance of Response Equipment.

Fast Reaction and Response Techniques

The basic program includes:

- ✓ Initial response and mobilization of the Response Structure.
- ✓ Response organization chart and responsibilities of each unit.
- ✓ Communication between the response units.
- ✓ Working systems, means and methods of communication.
- ✓ Data on dangerous substances (MSDS) and response techniques.
- ✓ Appreciation of the situation and evaluation of the accident.
- ✓ Basic techniques for limitation of the leakage and confinement of the spill.

Health and Safety

Direct Reaction Team: Its education should be referred to the following issues:

- ✓ Knowledge of the physicochemical properties of the pollutants and how dangerous they can be.
- ✓ Evaluation of the dangerous situations in situ, which involve the geomorphology of the area and weather conditions.

- ✓ Keeping the polluted area safe.
- ✓ Use of individual protection means.
- ✓ Safe use of equipment.
- ✓ Prediction of a possible expansion of the leakage to the subsoil, the surface or groundwater receptors and to the human infrastructure
- ✓ Evaluation of the necessity of additional response means.
- ✓ Control the polluted area.
- ✓ Consideration of dangers related to the limitation/rebound techniques.
- ✓ Safe use of communication means.
- ✓ Cleaning of personnel and equipment.
- ✓ Management of the waste produced.

Response Team: Its education should contain the above along with:

- ✓ Knowledge of the dangers that arise while applying the response techniques.
- ✓ Planning and taking appropriate safety measures, taking into consideration the available means and conditions of the area.
- ✓ Identifying and measuring dangerous substances (flammable, toxic) at the site, using appropriate devices.
- ✓ Evaluation of the work progress and confirmation of the safety measures adequacy.
- ✓ Ability to estimate the extent of the consequences of an accident and re-adjust the safety measures according to the conditions.
- ✓ Operation of Special Need in order to confront accidents such as appearance of fire etc.
- ✓ Knowledge of possible risks associated with the use of the personal protection equipment (respiratory devices etc).
- ✓ Cleaning process of personnel and equipment.

- ✓ Safe storage, transfer and disposal of the polluted waste.
- ✓ Knowledge of basic pollutants MSDS and response techniques applied.
- ✓ First Aid supplies.

Operation and Equipment Service

The manual of the constructor is an essential help for the right use, operation and service of the device and the operators ought to know it.

In certain occasions, operators must obtain permission.

5. Health and Safety

The hazards can be grouped into two major categories; the physical and the chemical ones. The physical hazards depend on the characteristics of the dangerous material and the existing conditions at the site of the accident, while the chemical hazards are divided into those which are related directly to the components of the dangerous material (primary) and into those which occur under certain conditions (secondary).

In order to reduce the probability of a secondary accident to happen, the three danger zones: prohibition zone, limit zone and support zone should be defined. The 3 zones specify the only areas where rescue personnel and equipment can be present, as well as the points for placing staff and technical means preventing from free access of the public to dangerous sites.

General safety instructions:

- Everyone who is involved in the accident response has to be adequately trained in order to use properly the personal safety means, the cleaning processes, the communication systems and the first aid supplies.
- Staying or moving unnecessarily in the area of the accident should be prohibited.
- The equipment used in the response operation should be approved and in compliance with certain safety conditions.
- All devices must be cleaned after use according to the constructors' instructions. They should be checked, conserved and preserved, so as to be ready for further use.
- First Aid Kit must contain necessary medicines, a body and eye cleaner, a stretcher with blankets, a bottle with clean water, single-use glasses and a fire extinguisher.
- Operators of crabs and other heavy machinery must obtain operation permission.

- Adequate lighting must be provided at all working areas.
- Access to the area where leakage of the chemical substance occurred should always be from the direction wind blows.
- Before entering an area where a leakage took place, the presence of flammable gases must be checked.
- Monitoring the quality of the atmospheric air (concentration of O₂, hydrocarbons and toxic gases) must be carried out before the response operation begins.
- Working in confined areas demands additional safety measures. The concentration of O₂ in the air must be checked regularly and must be considered acceptable only if it is within the range of 19.5-23%.
- Checking the existence of toxic gases and especially that of H₂S, benzol and CO is very important.
- Protection against electric shock can be achieved if the Response Teams are equipped with maps, on which the position of the underground infrastructure can be observed.
- Operation near generators or other electric machines must be done only by well-trained personnel.
- Flammable substances and waste must not be kept near electric equipment. Warning labels must be placed beside the machines which operate under 750 volts AC or 300 volts DC.
- Portable tools with metallic parts must be grounded unless they have double insulation or they operate at voltages under 50 volts. Other machines (e.g. drills) used for fighting an accident must keep a distance of at least 6m from aerial electricity lines.

As far as the personal protection is concerned, the means, usually used are gloves, helmets, glasses (usually made of PVC), working uniforms, boots or shoes with tough covers, ear protectives and respiratory devices. All APM must obtain CE certification.

In order to protect people over a larger area, it is suggested to empty these areas according to Danger Zones, to inhibit access to areas neighbouring to the leakage area, to prohibit or restrict water usage and to inform inhabitants about the possible dangers.

Effective protection of public demands the cooperation between the public Authorities and Services.

6. Administrative Support

The administrative support of the response operation involves the infrastructures installation, the supply of the necessary response means, the transfer and communication and finally the health, food and residence of personnel.

■ Infrastructures Installation

The infrastructures created in the field should include: On-site Operation Centre, Cleaning Stations for Equipment and People, First Aid Posts, Places for Eating and Resting, Parking Places, Means Subsistence and Temporary Waste Storage.

The location of the On-site Operation Centre must be in a safe and accessible place near the accident, with communication ability and supply of water and electricity.

Special areas for First Aid, Eating and Resting of the personnel must be located away from polluted materials.

■ Supply of Necessary Spill Fighting Means

Means adequacy should be achieved in less than 8 hours for level 1 accidents, in 24 h for level 3 and in 72 h for level 5.

■ Transfer and Communication

Transfer is realized mostly by road and includes the transport of personnel, equipment, supplies and solid or liquid waste.

Transfer planning involves: transport means, transferred materials, temporary stations of the transport means, external transporters that might be used and maps.

Aviation means can be used in case air observation of the operation or immediate transfer of injured persons is needed.

Basic communication means used during the response operation are telecommunication, or/and radiofrequency VHF.

■ **Health, Food Providing and Accommodation for Personnel**

During the response operation, continuous supply of food and water to the response personnel is necessary. For this reasons the Support Manager should act according to the circumstances and carry out a combination of the following actions:

- ✓ Setting catering services responsible for providing food.
- ✓ Creation of a supplies storage area.
- ✓ Transport of food.
- ✓ Renting of rooms at the neighbouring hotels.
- ✓ Supplying and transportation of bottles with water.
- ✓ Use of water from the existing or new sources, or drills after checking its quality or water purification.



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