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Checklists for surveying and assessing industrial plant handling materials and substances, which are hazardous to water

№ 7

Transshipment

For our Environment

Umwelt Bundesamt

DOKUMENTATIONEN 15/2015

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Building and Nuclear Safety

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Transshipment

by

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Recommendations of the International River Basin commission for transshipment

Definitions:

Transshipment can be seen as a connecting link between transport and storage. The term "transshipment" refers to the stationary area during the process of uploading and offloading of ships, trucks, or railway wagons.

1. Transhipment sites must be resistant to the expected mechanical stress and be sufficiently tight and resistant to spilled liquids. The organisational measures stipulated in the danger protection plan can also be considered when assessing whether the site of transshipment is sufficiently tight and resistant to the substances in question.
2. When uploading and offloading with the aid of pipeline, automatic safety devices must be provided which can interrupt the flow of substances in case of an accident and thereby prevent the spillage of substances hazardous to water.
3. Spillage of substances hazardous to water must be detected fast.
4. Transhipment sites must have collecting facilities capable of accommodating the volumes of liquid that can escape until
   - Suitable measures or
   - Automatic safety systems take effect.
5. Contaminated rainwater and fire fighting water resulting from an accident must not be discharged directly into the waters. It must be subjected to suitable treatment.
6. Transshipment sites must
   - be clearly marked or labelled;
   - be identified as a safety zone while transhipment is in progress.
7. Equipment suitable for immediate use must be kept ready at transhipment sites to prevent the spread of dangerous substances. Equipment for removing the substances is also necessary.
8. When uploading and offloading inland waterway vessels, special care must be taken to observe the checklist under the General German Register of Norms (ADNR).
9. Transhipment of substances hazardous to water at the shore of a waterway should be avoided, especially in the case of new installations.
10. The contracting parties should stipulate that in cases of transhipment of dangerous goods the transhipment receptacles (e.g. containers) are clearly marked or labelled with approriate danger symbols.

Checklist for monitoring the implementation of the recommendations

General details on transshipment process

Name of operation:

Type of transshipment process

❒	Road tanker	→ ❒	Tank farm/container	→ ❒	Road tanker
❒	Railways tank wagons	→ ❒	Tank farm/container	→ ❒	Railways tank wagons
❒	Tanker	→ ❒	Tank Farm/Container	→ ❒	Tanker
❒	Mobile container	→ ❒	Tank farm/container	→ ❒	Mobile container

Name of material:
(for further details see Checklist No. 1 „Substances“)

Remarks:

1 State, tightness and durability of the floor at the transshipment site

1.1 Material for the construction of the floor at the transshipment site

❒ Concrete ❒ Steel ❒ Asphalt/Bitumen ❒ Others

Description of others:

Remarks:

1.2 Is the site of transshipment resistant to mechanical stress caused by, e.g., vehicles?

❒ Yes ❒ No ❒ Not applicable

Remark: organisational measures can be considered in this assessment.

❒ Action ❒ No action

Remarks:

Examples of actions:

Short-term measures:

- In case the site is not sufficiently resistant and durable, visual inspection should be conducted after each transshipment process and detected damages repaired.
- Utilisation of mobile collecting basins for detachable pipeline.

Medium-term measures:

- From the funds of the plant to cover with asphalt or bitumen the surface used to receive a consignment. The coating must be resistant to mechanical impact of technical means.

Long-term measures:

- Construct the sealing surface with material able to resistance durably to mechanical stress caused by vehicles and other machines, such as: concrete, steel sheets, mastic asphalt.

1.3 Is the surface sufficiently tight and resistant to the spilled liquid substances? (See also Checklist 05 "Sealing systems")

❒ Yes ❒ No ❒ Not applicable

❒ Action ❒ No action

Remarks:

Examples of actions:

Short-term measures:

- Repair of cracks and other damages.
- In case the site is not sufficiently resistant and durable, replaceable collecting basins should be placed under the connecting point of detachable pipe or hose pipe (e.g., railways tank wagons or a road tanker).
- Bonding agents should be provided to bind the spilled liquid substances.

Long-term measures:

- In case the site is not sufficiently resistant to spilled liquid substances, the sealed surfaces should be constructed with such materials which are suitable and resistant to the liquid substances e.g. concrete, steel sheets, ceramics, mastic asphalt.

- The sealed surface should be large enough (at least the size of the vehicle and the space under the pipelines (hoses) or pipe connections leading to the plant unit).
- The joints of the sealed surface should meet the tightness requirements.

Determination of the real risk

Is the sub-point of the recommendation implemented?

Yes	Partially	No
❒	❒	❒
RC=1	RC=50	RC=100

2 Loading and offloading with pipelines

❒ relevant ❒ not relevant→ 3

2.1 Are automatic safety devices provided to interrupt the flow of liquids and prevent the discharge of water-hazardous substances in case of accident?

❒ Yes ❒ No ❒ Not applicable

❒ Action ❒ No action

Remarks:

Examples of actions:

Short-term measures:

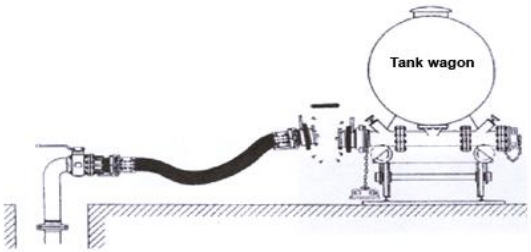
- Use of blocks (wedges) to prevent vehicles from moving.
- Formulation of operating instructions → Instructing the personnel
- Characterise the hose pipes by painting them in different colours
- Make sure that the containers are not filled beyond their maximum filling level.

Medium-term measures:

- Stationary pipelines for emptying road tankers should be equipped with a swing check valve if the backflow of liquid from the plant which can lead to the spillage of the substance is possible.
- Use only fittings that are specific to the products → that will help to avoid connecting hose pipe that are not suitable.
- Make sure there are not too many different types of hoses in use.

Long-term measures:

- Installation of safety disconnecting connectors for road tankers and railway tank wagons.
- Installation of devices to stop the process in case of an emergency (a sort of Emergency-OFF systems).



Filling process using a flexible pipeline with automatic detachment on both side

Determination of the real risk
Is the sub-point of the recommendation implemented?

Yes	Partially	No
❒	❒	❒
RC=1	RC=50	RC=100

3 Detection of spilled substances hazardous to water

3.1 Can spilt water-hazardous substances be detected fast?

❒ Yes ❒ No ❒ Not applicable

❒ Action ❒ No action

Remarks:

Examples of actions:
Short-term measures:
- Perform loading & offloading process always with two operating personnel.
- Regular leakage tests of hose connections and sealing of all liquid handling components, used for transportation of liquids.
- Equip the containers with a metering device
- If it is technically possible, conduct pressure and tightness tests on the pipelines used for the loading & offloading processes.

Medium-term measures:
- Plant connections used for connecting hoses should be laid above the sealed surface of the transshipment site.

Long-term measures:
- Guarantee a quick detection of spilled substances by an appropriate design of the unit, e.g., by:
  - installing of flanged and screwed connected pipelines above the sealed surface.
  - construct the sealed surface with a slope towards the collecting pit (lowest portion of the surface) for quick detection of spilled liquid substances.

Determination of the real risk
Is the sub-point of the recommendation implemented?

Yes	No
❒	❒
RC=1	RC=10

4 Collecting facilities

4.1 Is the capacity of the collecting facility sufficiently sized?

_____ m^3
❒ _____ m^3

❒ Yes ❒ No ❒ Not applicable

❒ Action ❒ No action

Remarks:

Examples of actions:

Short-term measures:

- Perform loading & offloading process always with two operating personnel.
- Place a replaceable collecting basin under detachable pipelines, for example pipe connections to railways tank wagons.
- Facilities to pump or collect spilled liquid substances, e.g. small mobile pumps, mobile tanks.

Long-term measures:

- Provision of a sufficient containment volume.

a) **Automatic safety device available:**

Take into consideration the volume which may be released after an accident and the time lapses before the safety device becomes effective to prevent further discharge of liquid substances.

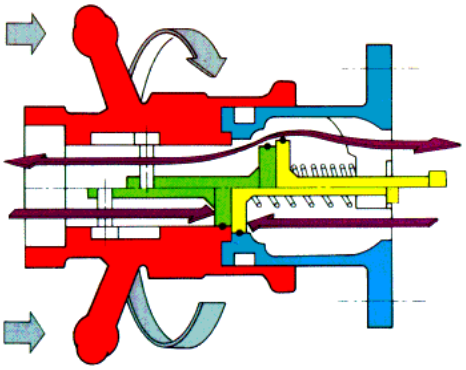
b) **No safety device available:**

Consider the volume which may be discharged from the vessel and the time needed to implement appropriate safety measures to prevent further discharge of liquid substances (normally five minutes; "Five-minute rule").

c) **Filling of mobile tanks up to 1,000 l based with weight or volume controlled devices:** Provide containment volume for the largest vessel.

d) **Filling of mobile tanks up to 1,000 l with automatic dispensing valve:**

Minimum containment volume - 60 l.



Dry coupling devices:

- These are the coupling devices with automatic shut-off valves that closes automatically on both sides without **leakages**

Determination of the real risk

Is the sub-point of the recommendation implemented?

Yes	No
❒	❒
RC=1	RC=100

5 Rainwater and fire fighting water in case of an accident

5.1 Are there outlets for the disposal of contaminated rainwater and fire-fighting water, e.g., through a channel or sewage systems?

❒ Yes→ 6 ❒ No→ 5.2 ❒ Not applicable

❒ Action ❒ No action

5.2 Is there any guarantee that contaminated rain or fire fighting water are treated appropriately before being discharged directly into the waters?

❒ Yes ❒ No ❒ Not applicable

❒ Action ❒ No action

Remarks:

Examples of actions:

Short-term measures:

- Collecting discharged liquid substances from surfaces and cleaning the surface thereafter.
- Regular check of rainwater for contamination before a direct discharge into the waters.
- If required, make provisions for an in-house treatment of contaminated rainwater.
- Shut off the discharge outlets of the sealed surface during the process of filling and emptying containers (vehicles, etc.) by using a technical device.
- In case of a fire, collecting and retention of the fire fighting water by using mobile machines or appliances (e.g., pumps, tanks).

Medium-term measures:

- Verify the tightness of the draining pipes.

Long-term measures:

- Guarantee the treatment of contaminated rainwater with an appropriate treatment plant.
- Containment of the contaminated rain and fire-fighting water in special containment basins. Discharge into the waters only after contamination checks, and where applicable, treat.

Determination of the real risk

Is the sub-point of the recommendation implemented?

Yes	Partially	No
❒	❒	❒
RC=1	RC=50	RC=100

6 Characterising of transhipment site

6.1 Is the transshipment site clearly marked as such?

❒ Yes ❒ No ❒ Not applicable

❒ Action ❒ No action

6.2 Is the transshipment site declared as a danger zone during the process of loading & offloading?

❒ Yes ❒ No ❒ Not applicable

❒ Action ❒ No action

Remarks:

Determination of the real risk
Is the sub-point of the recommendation implemented?

Yes	Partially	No
❒	❒	❒
RC=1	RC=5	RC=10

7 Spread and removal of substances

7.1 Are facilities and means available to prevent the spread of the substances?

❒ Yes ❒ No ❒ Not applicable

Name the facilities:

7.2 Are appliances available to collect and remove discharged water-hazardous substances?

❒ Yes ❒ No ❒ Not applicable

Name the facilities:

❒ Action ❒ No action

Remarks:

Examples of actions:
Short-term measures:
- Provision of bonding agents.
- Provision of small mobile pumps and tanks.

Long-term measures:
- Provision of suction devices.
- When loading and offloading at a transshipment site in the vicinity of the shores of over ground waters, floating oil barriers should be applied.

Determination of the real risk
Is the sub-point of the recommendation implemented?

Yes	Partially	No
❒	❒	❒
RC=1	RC=5	RC=10

8 Loading and offloading of inland river tankers

❒ relevant ❒ not relevant→ 9.

8.1 A check list acc. To BHPH (ADNR) is attached in the appendix of this check list. Is this check list being taken into account?

❒ Yes ❒ No ❒ Not applicable

❒ Action ❒ No action

Remarks:

Determination of the real risk
Is the sub-point of the recommendation implemented?

Yes	No
❒	❒
RC=1	RC=10

9 Transhipment of water-hazardous substances near the shores of over ground waters

❒ relevant ❒ not relevant

9.1 Are loading and offloading equipment available for ships?

❒ Yes ❒ No→ 9.3 ❒ Not applicable

9.2 Can the transshipment be performed without operating an existing unit for loading and offloading of water-hazardous substances from inland river tankers?

❒ Yes ❒ No ❒ Not applicable

9.3 Is there any plan by the operator of the transshipment site to modify or enlarge the unit or to build a new unit?

- Modification: ❒ Yes ❒ No
- Enlargement: ❒ Yes ❒ No
-Build a new unit: ❒ Yes ❒ No

❒ Action ❒ No action

9.4 Did the operator submit an application to the competent authorities concerning the modification or enlargement of the existing transshipment unit, or the building of a new unit?

	Application submitted		Approved	
- Modification	❒ Yes	❒ No	❒ Yes	❒ No
- Enlargement	❒ Yes	❒ No	❒ Yes	❒ No
- Build a new unit	❒ Yes	❒ No	❒ Yes	❒ No

❒ Action ❒ No action

Remarks:

Examples of actions:
Short-term measures:
- Planning modifications concerning the enlargement or the building of a new unit.
- Involvement of the competent government authority for the further evaluation process.

Determination of the real risk
Is the sub-point of the recommendation implemented?

Yes	Partially	No
❒	❒	❒
RC=1	RC=5	RC=10

10 Danger symbols marking

10.1 Are the transhipment tanks (e.g. Containers) marked or labelled with danger symbols?

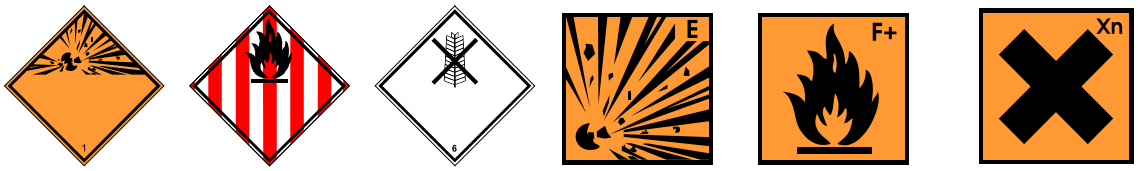
❒ Yes ❒ No ❒ Not applicable

❒ Action ❒ No action

Remarks:

Examples of actions:
Short-term measures:

- Contractual agreement between the companies and the suppliers, or the forwarding agents to use only such transporting vessels (tanks, containers) which are clearly marked with the danger symbols.



When loading and offloading dangerous goods, the vessels for this process (e.g. containers) should be clearly marked or labelled with appropriate danger symbols.

Determination of the real risk
Is the sub-point of the recommendation implemented?

Yes	No
❒	❒
RC=1	RC=10

Summery of the Checklist

Sub-point of the Recommendation	Possible Risk category	Risk categories
1	1 / 50 / 100	
2	1 / 50 / 100	
3	1 / 10	
4	1 / 100	
5	1 / 100	
6	1 / 5 / 10	
7	1 / 5 / 10	
8	1 / 10	
9	1 / 5 / 10	
10	1 / 10	

Average **R**isk of the **C**hecklist **(ARC)**