Grounding measures for the fire brigade to dissipate static charge

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System hk-erdung

Cable drum as the central point

according to German standards

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System hk-erdung

The devices made by the company hk-erdung comply with the relevant German regulations and standards and may be used in potentially explosive atmospheres!

Introduction

In the case of accidents with dangerous substances, electrostatic charges can occur as a result of the incident itself or as a result of the fire brigade's operational measures.

If a discharge spark occurs in an ignitable atmosphere, an explosion can occur.

Introduction

For example, electrostatic charging can occur

- before the fire brigade arrives due to friction during the accident
- due to friction when pulling tarpaulins etc.
- through product leakage
- through the promotion of products by the fire brigade.

Introduction

Electrostatic discharge can occur, for example, through equipotential bonding

- by emergency services themselves who are conductive to earth
- when grounding clamps are attached
- when ladders are leaned on
- when delivery lines are connected or immersed.

Purpose of grounding

- to discharge the already existing charge
- to equalize the existing potential differences
- to prevent the charge build-up during use.

Hints

- it is recommended that the grounding material is being checked annually for electrical conductivity. The resistance between the endings must not exceed 10^6 ohms. After each use, the used material should be subjected to a visual inspection
- the review should be recorded.

Hints

- the relevant regulations and the state of the art must be observed.
- the grounding material may **ONLY** be used to dissipate electrostatic charges.

Hints

- in particular, your own devices must be checked for conductivity between the couplings (e. g. peristaltic pump, hoses, ...)
- with high humidity (humid atmosphere) or damp / wet surfaces, the risk of static charge is reduced.

Hints

To avoid an explosion during the grounding measures

- the clamping on the damaged object should be as far away as possible from the exit point first (explosive atmosphere)
- also the star point (cable drum) should have no conductive connection to the ground initially and be outside the potentially explosive atmosphere if possible
- the conductive connection to the ground on the grounding spike or something similar should only be established after the grounding process has been completed on the damaged object
- clamping and plugging processes should be monitored with an explosimeter.

Hints

- all measures (e. g. clamping, coupling) which can lead to a charge equalization (ignition sparks) are to be carried outside of potentially explosive atmospheres, if possible
- use conductive equipment and vessels as far as possible
- avoid measures that lead to static charging (friction, pulling a tarpaulin over the floor).

Hints

- usually the following have to be grounded
  - the damaged container, from which the product emerges
  - the collecting container
  - the pump section (only once, if it is ensured that there is a conductive connection over the entire route)
  - the recovery container (as conductive as possible)
- first ground everything, then set up the pump section and immerse the suction hose.

Hints

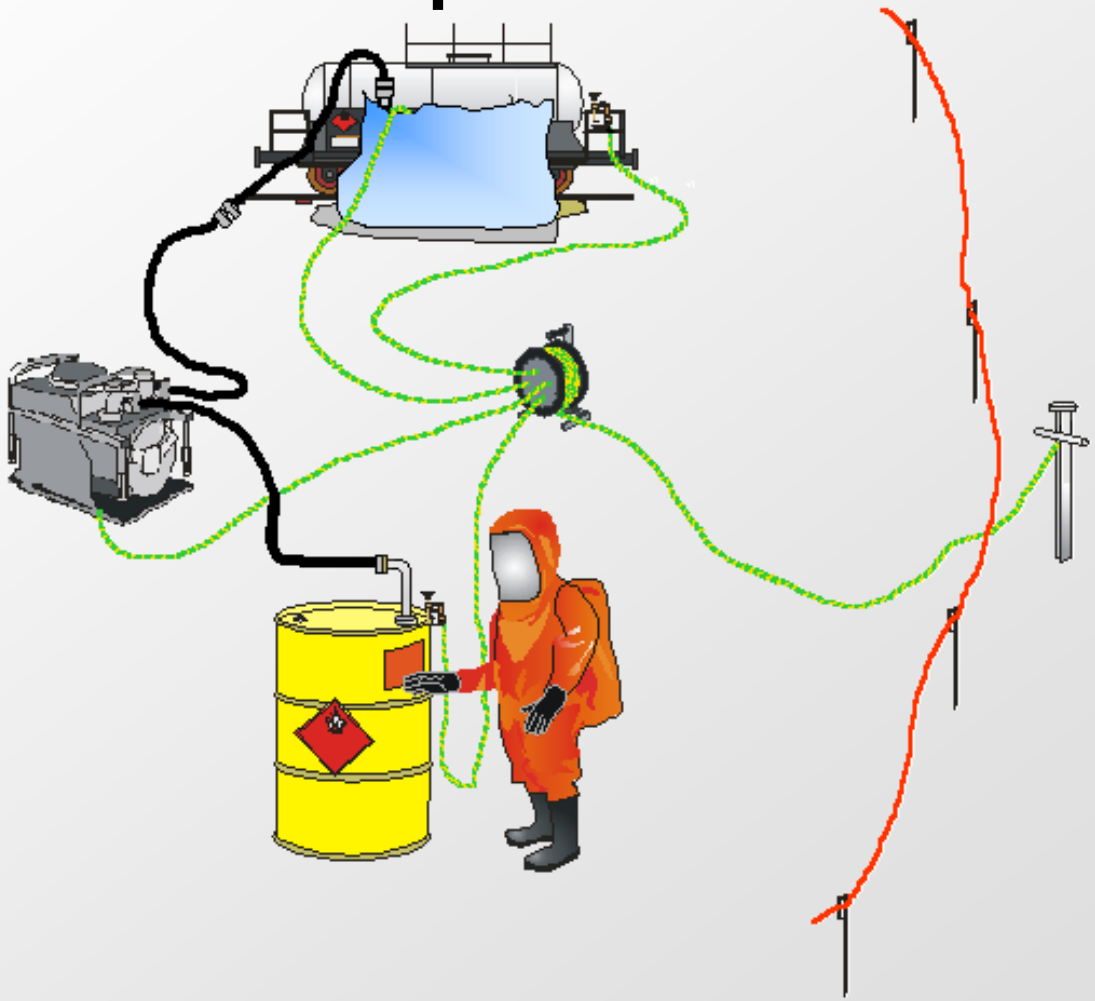
- when used in the railway sector
  - the overhead line in front of and behind the scene of the incident must be earthed. (Rails and other equipment are adequately earthed in the intended condition)
  - if the rails are broken, all rails on both sides of the rail endings must also be grounded.

Limit

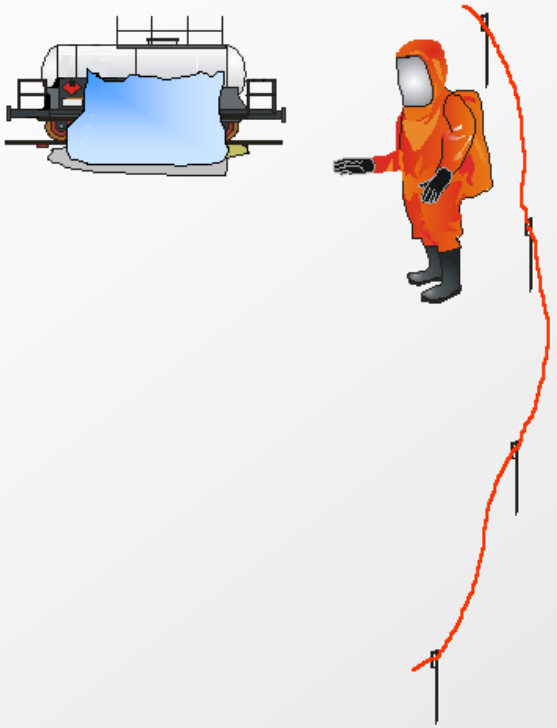
- according to TRGS 727, the leakage resistance to earth must not exceed 10^6 Ω [ohm] (1 000 000 Ω, 1 000 kΩ)
- the resistance of the devices, hoses, fittings, cables, ... must not exceed 10^6 ohm

The processes described in the following part are only examples that should be implemented according to the event of an application.

Sequence

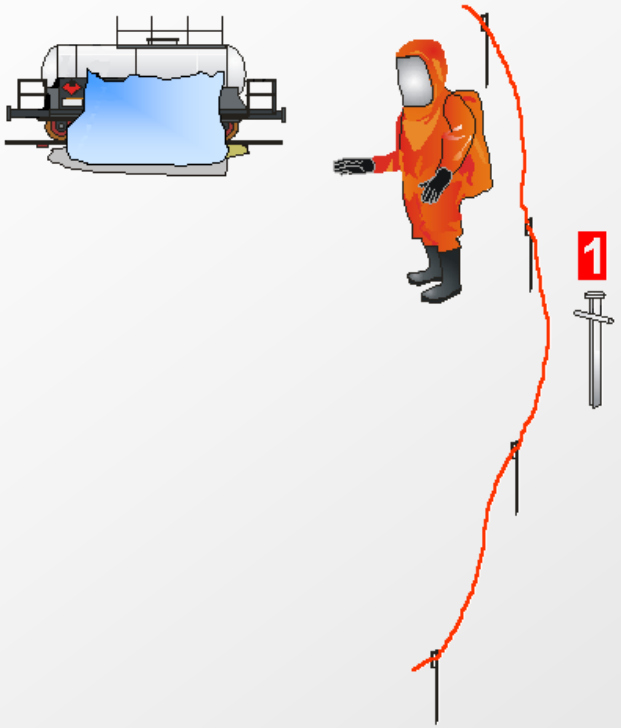


Sequence 0



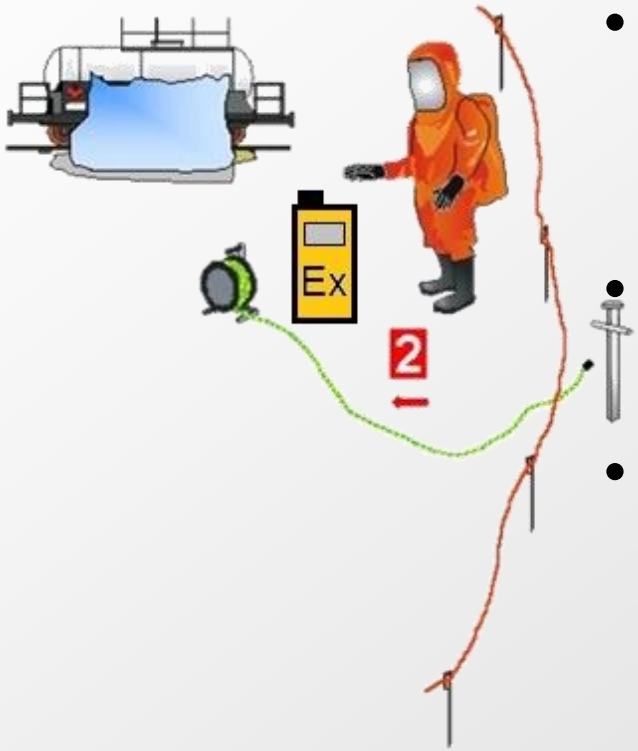
- place the collecting container / tarpaulin under the leak
- use a conductive collection container, if possible
- alternatively: start grounding immediately.

Sequence 1



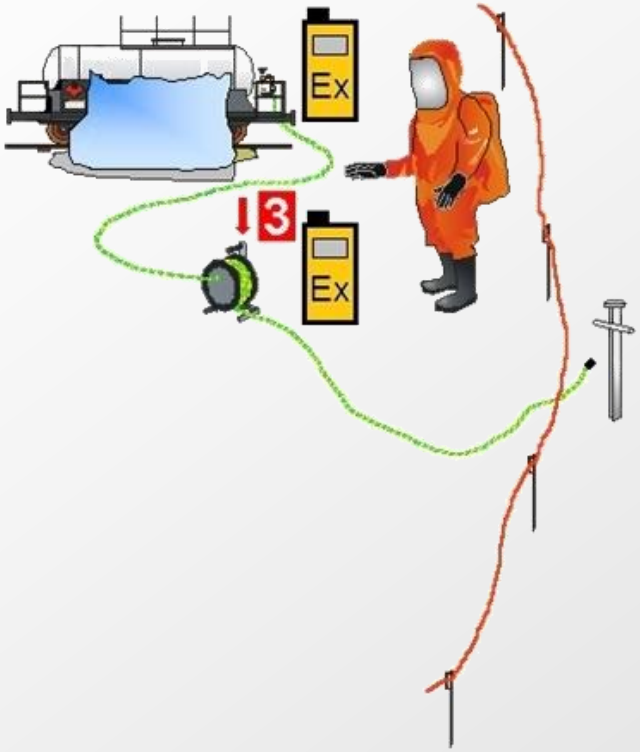
- look for a grounding spot (e.g. grounding spike, lightning rod, railroad tracks, guardrails, ...) outside of the endangered area
- push the ground spike all the way into the ground at the shut-off limit
- if the soil is dry, water the soil (these measures could run parallel to the following).

Sequence 2



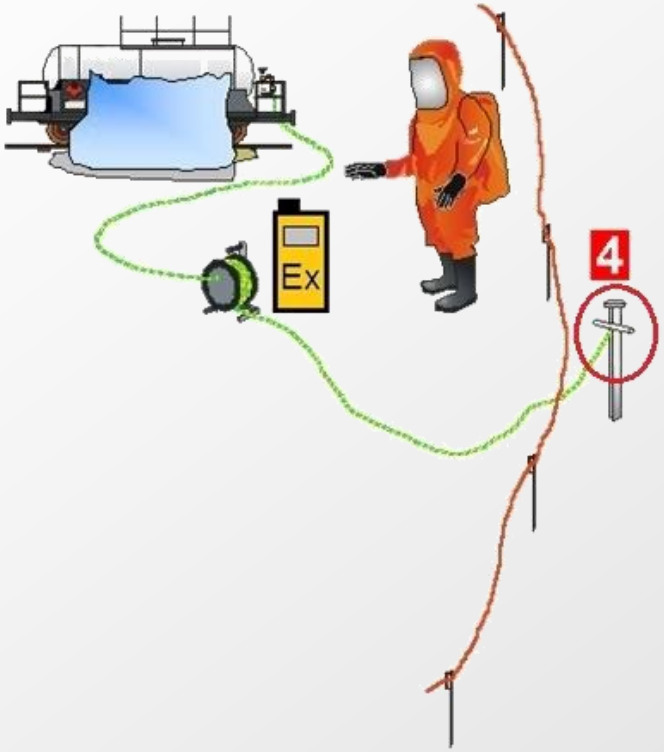
- unroll the cable drum from the grounding point to the central point
- **attention: do not connect to the grounding point yet!**
- the central point should be outside of the potentially explosive atmosphere.

Sequence 3



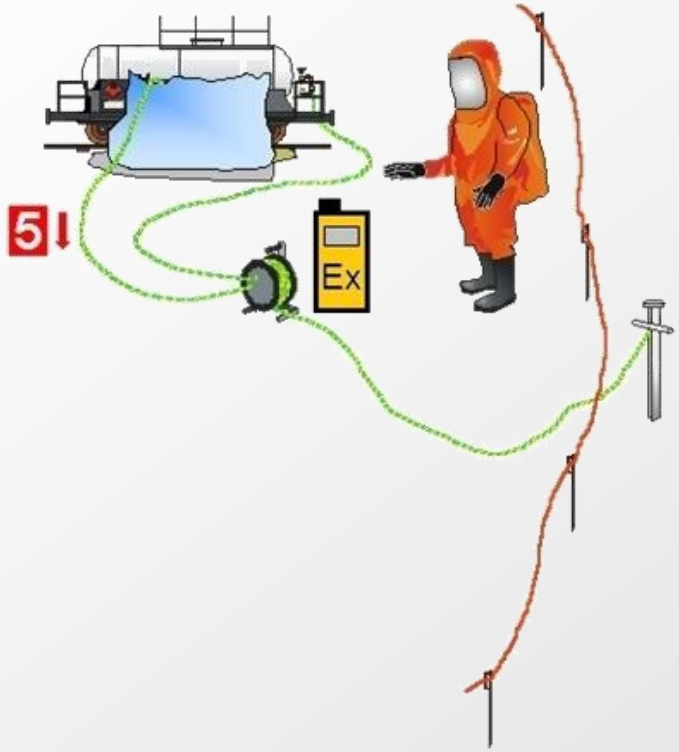
- fasten clamp pliers to the damaged object
  (In the greatest possible distance to the exit point and outside of an explosive atmosphere)
- lay the grounding cable from the defective container to the cable drum and connect it there

Sequence 4



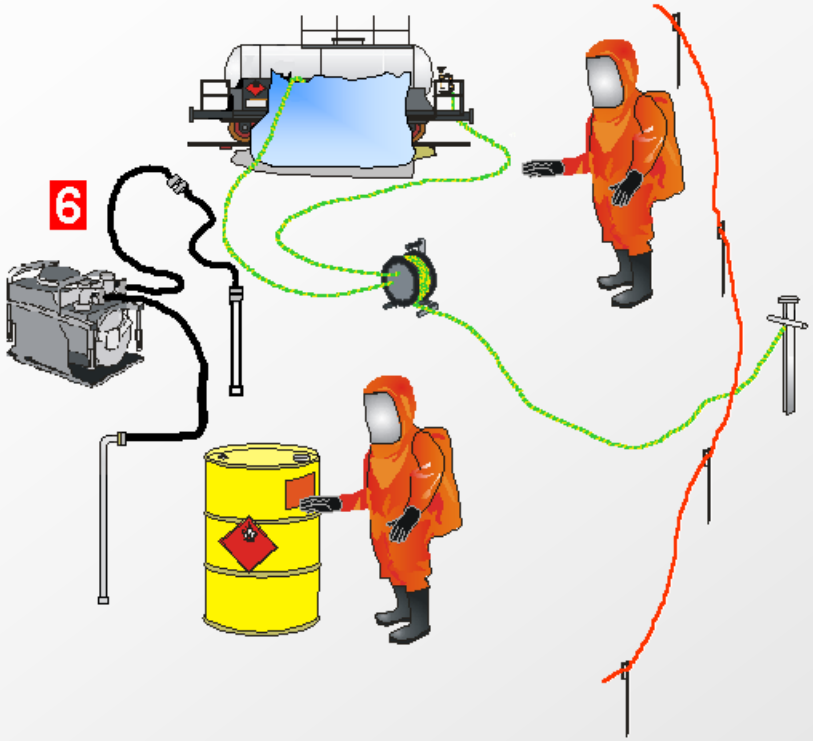
- connect the cable drum to the grounding point.

Sequence 5



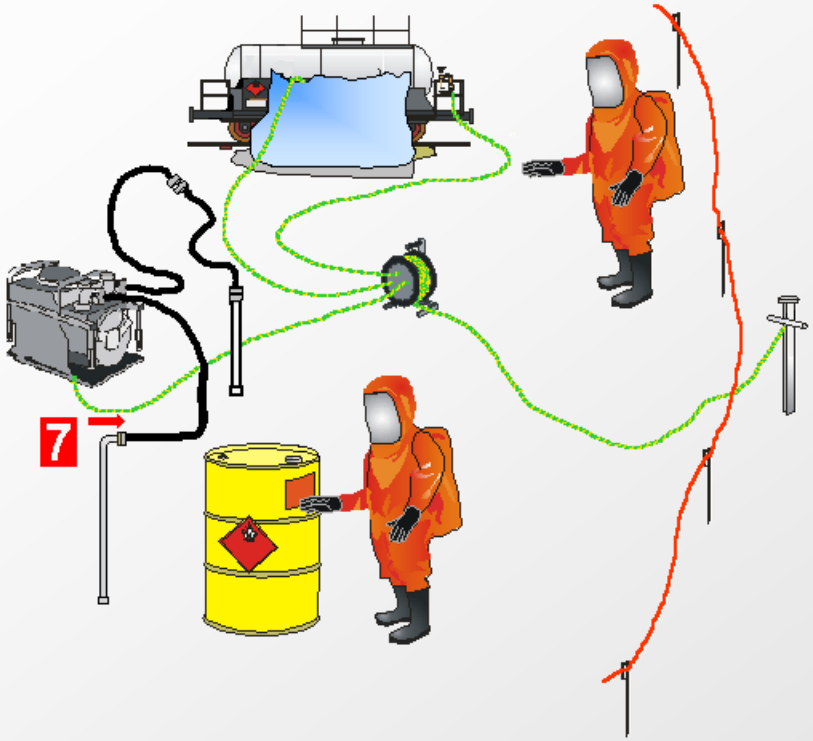
- lay the grounding cable from the collecting container to the cable drum and connect it there.

Sequence 6



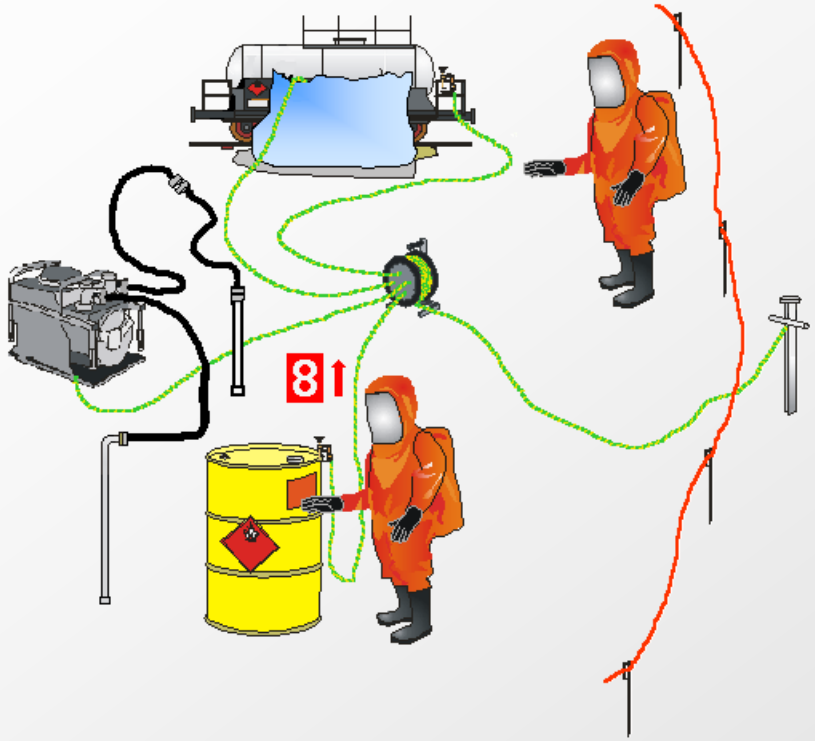
- if possible, set up the pump section outside of the potentially explosive atmosphere
- **do not immerse the suction line yet**

Sequence 7



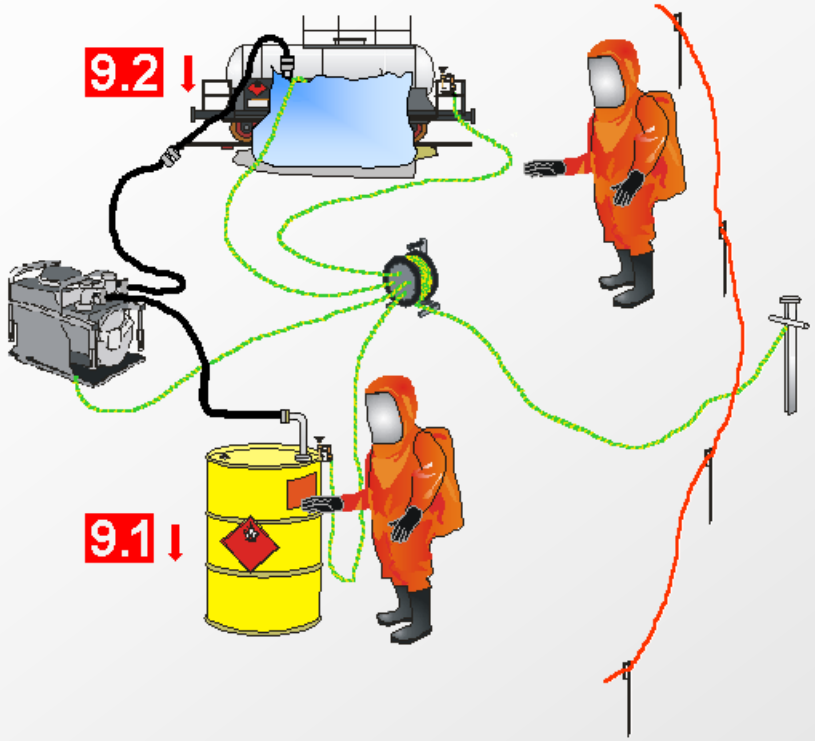
- connect the pump section to the cable drum
- if the pump section is conductive between both ends, it must only be grounded once
  (if possible at the grounding point of the pump)

Sequence 8

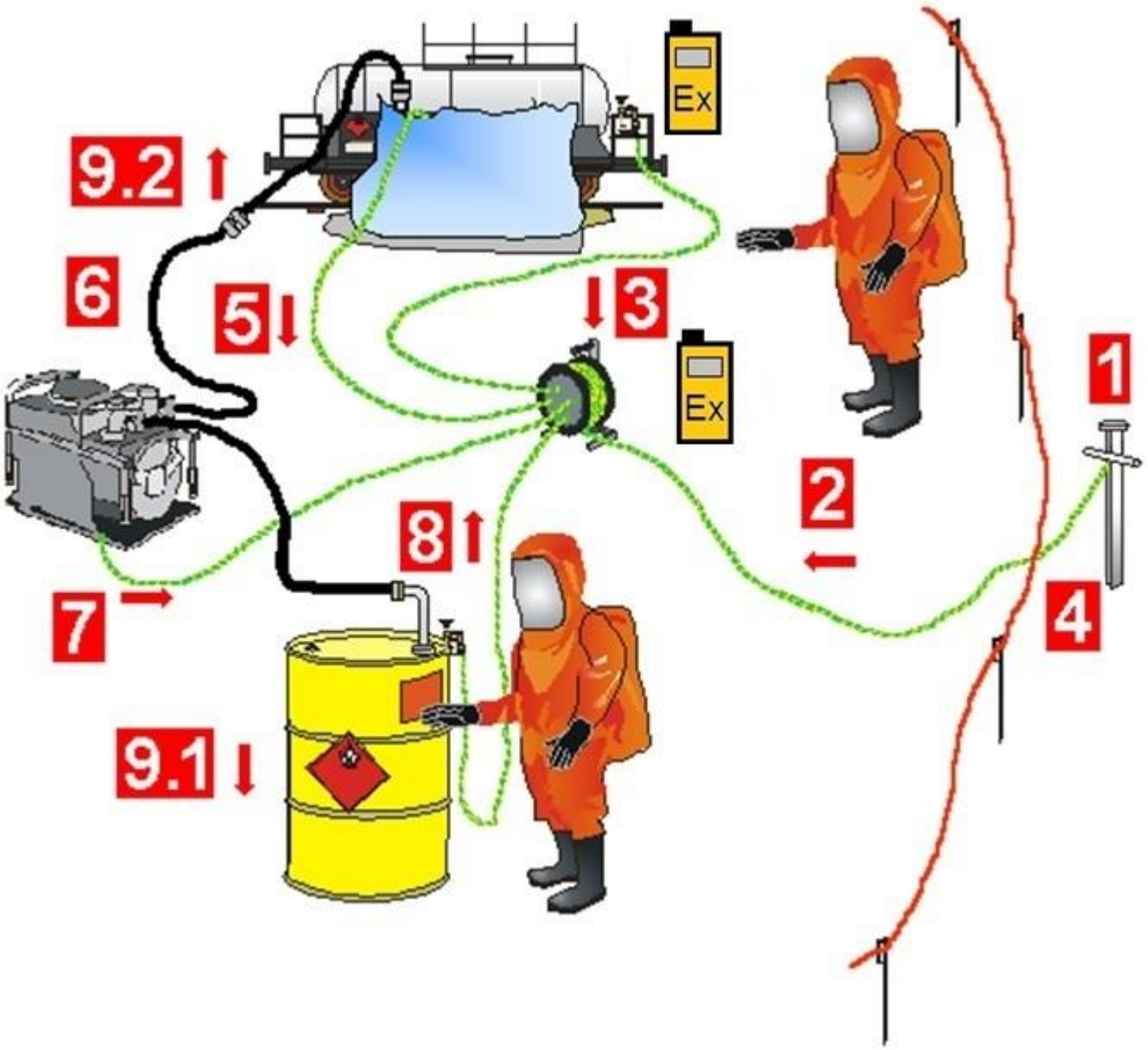


- prepare the conductive recovery container
- connect the recovery container to the cable drum.

Sequence 9



- immerse the outlet into the recovery container down to the bottom of the container
- immerse the suction line into the container which is to be emptied.


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Ex
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