

Economic Commission for Europe

Inland Transport Committee

Working Party on the Transport of Dangerous Goods

25 September 2024

**Joint Meeting of the RID Committee of Experts and the
Working Party on the Transport of Dangerous Goods**

Geneva, 10–13 September 2024

Item 5 (a) of the provisional agenda:

Proposals for amendments to RID/ADR/ADN:

Pending issues

**Need for an exemption in RID/ADR/ADN for the carriage of
Dangerous Goods in used machines, apparatus or articles**

Transmitted by The European Chemical Industry Council (Cefic)

UNECE Joint Meeting on TDG(WP.15/AC.1) Sept. 2024



Need for an exemption in ADR/RID/ADN for the carriage of Dangerous Goods in used machines, apparatus or articles



Gerhard Bruss, September 2024



Dangerous Goods in Machines, Apparatus or Articles

Shutting down of a large-scale plant – example steam cracker

- Area of 13 football fields
- Several columns
- More than a hundred pumps
- Thousands of valves

In case of a large shut down: new inspection

- Cleaning
- Dismanteling of the installations
- Maintenance of machines/equipment
 - also use workshops external workshops



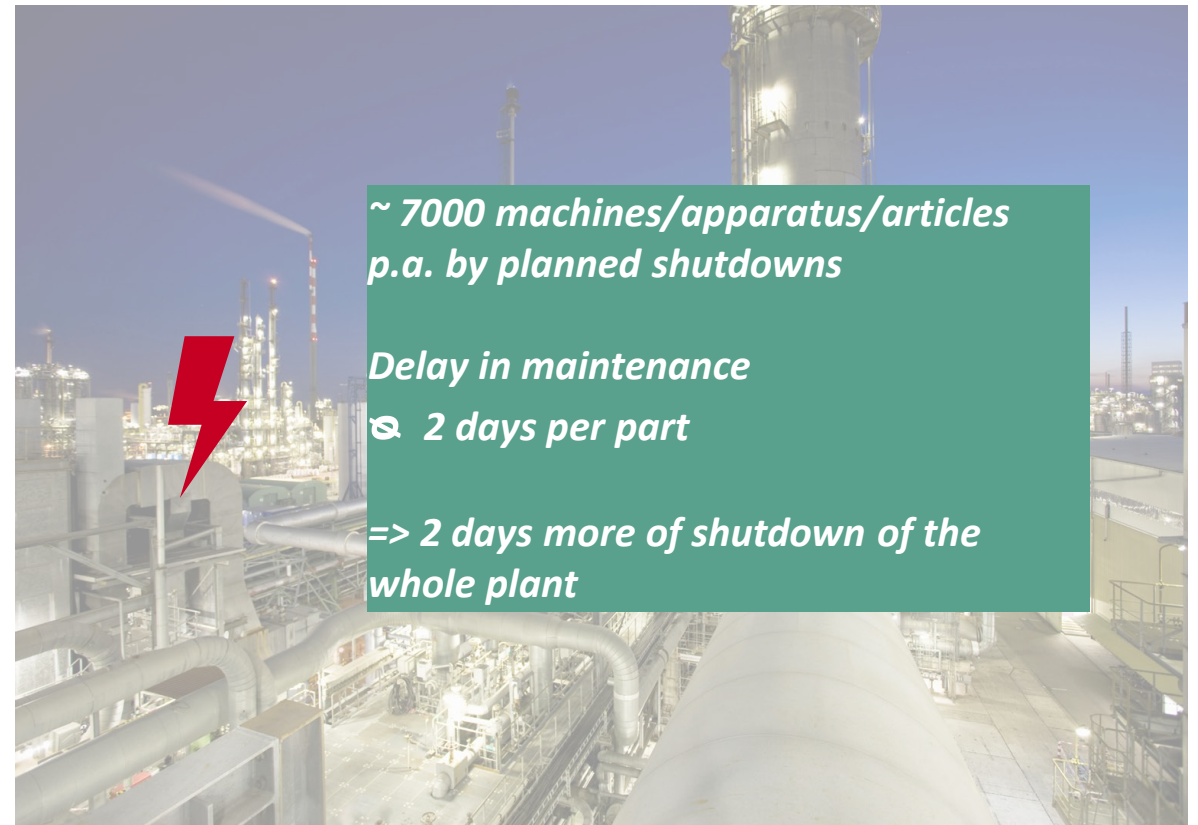
Dangerous Goods in Machines, Apparatus or Articles

Shutting down of a large-scale plant – example steam cracker

- Area of 13 football fields
- Several columns
- More than a hundred pumps
- Thousands of valves

In case of a large shut down: new inspection

- Cleaning
- Dismanteling of the installations
- Maintenance of machines/equipment
 - also use workshops external workshops



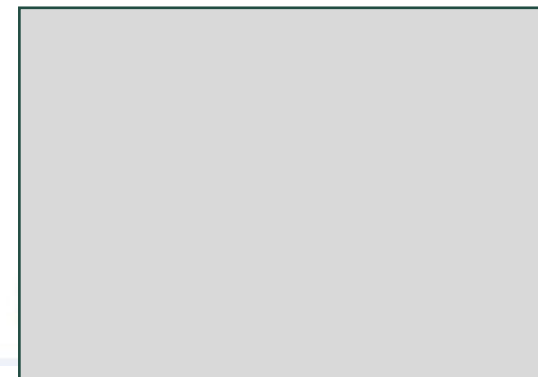
Dangerous Goods in Machines, Apparatus or Articles

Contaminated plant components – what's the problem?

- Chemical not intentional for the functionality of the device (such as air conditioner with refrigerant)
- Apparatus or machinery containing residues of dangerous goods
- contain residues from the product or rinsing detergents or solvents inside
- despite flushing (e.g. through dead spaces) **flushing ≠ chemical-free!**
- Dangerous goods cannot easily leak out from the dead space



Pressure Regulator



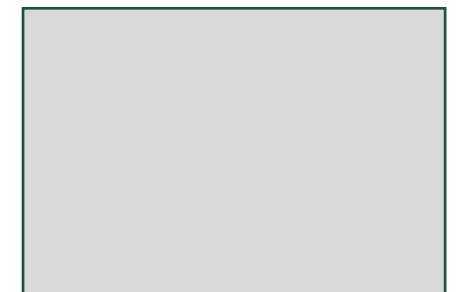
Centrifugal pump



Flowmeter



Heat exchanger



Ball valve

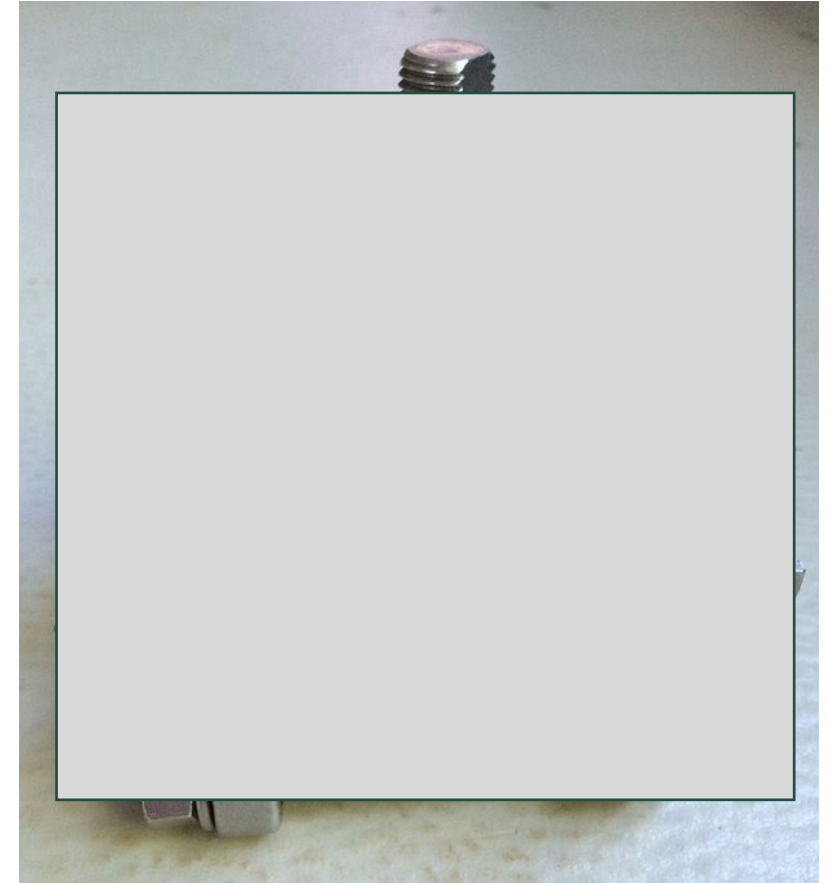


Dangerous Goods in Machines, Apparatus or Articles

Contaminated plant components – the challenge

"Dead spaces" and contamination possibilities:

- Corners of a ball valve
 - depending on the size between a few cm³ to more than 1 liter
- Diffusion into cracks
 - Defects in coatings, behind welds
 - Temperature fluctuations can lead to product releases (melting point)
- Risk of flushing media – can be other dangerous goods (e.g. monochlorobenzene; methanol)
- Residual quantities difficult to determine or estimate out from the dead space



Source [Ball Valve - Kugelhahn – Wikipedia](#)



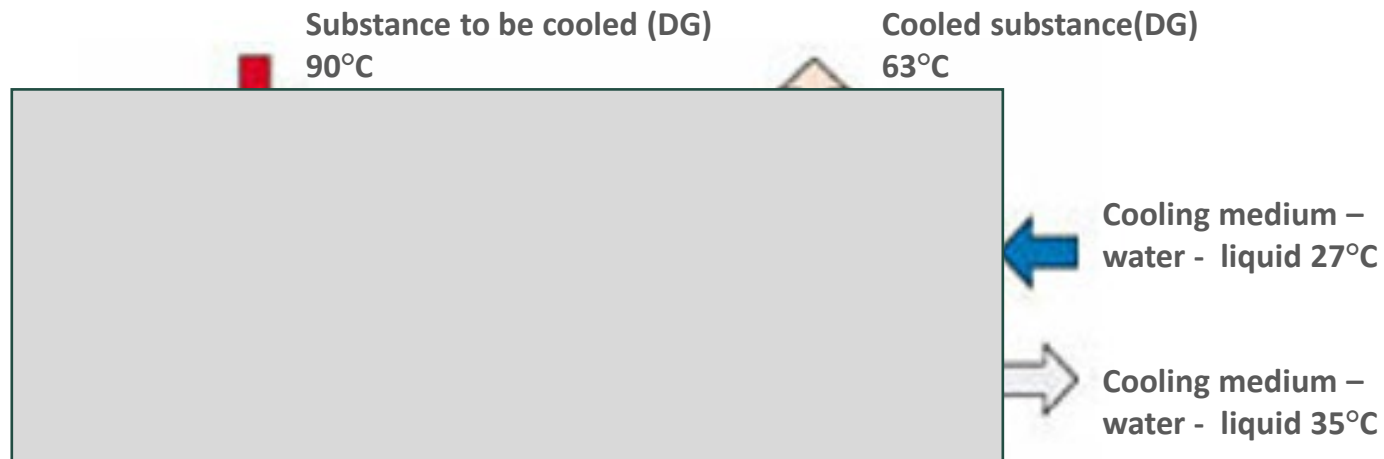
Flushed ≠ free of chemicals

Dangerous Goods in Machines, Apparatus or Articles

Contaminated plant components – the challenge

Tube bundle heat exchanger:

- Heat from the dangerous goods to be cooled is transferred to the cooling medium
- Media are spatially separated from each other in the heat transfer process (e.g. inside and outside of the pipe)



Source: www.Funke.de

Residual contamination in a heat exchanger:

- Diffusion into non-flushable areas:
 - Poorly processed or corrosion-porous welds
 - Defects in coatings
- Poor accessibility (corners and edges):
 - Residue-free rinsing not possible



Flushed ≠ free of chemicals

Dangerous Goods in Machines, Apparatus or Articles

Contaminated plant components – the challenge

Tube bundle heat exchanger:

- Impeller rotates around drive shaft
- Housing of the impeller is filled with product to be conveyed
- Continuous drive shaft must be sealed
- Seals can wear out
- Product entry into the housing

Possibility of contamination



Source: [Spiralgehäusepumpe \(ksb.com\)](https://www.ksb.com)



Flushed ≠ free of chemicals

Dangerous Goods in Machines, Apparatus or Articles

Example for an industrial process for contaminated apparatus: maintenance in the workshop

Removal of an apparatus for repair in the workshop:

Device isolated and flushed

Pre-flushed when installed (e.g. demineral. Water)

Maintain article-specific data: Type of machine/apparatus/article, last content/substance(s), dangerous goods?

Removal of the device

Marking Blinding

Transport note/doc for (internal) transport: Data on dangerous good(s), safety instructions, flushing condition, etc.

Internal Transport to the washing/cleaning area



Flushing/cleaning of the machine/article

Updated transport note: If necessary cleaning medium/solvent, flushing condition, residual contamination, safety instructions

Transport to internal workshop

Decision about repair or maintenance, internal or external



Decision about maintenance/repair in internal or external workshop



Dangerous Goods in Machines, Apparatus or Articles

Example for an industrial process for contaminated apparatus: maintenance in the workshop

Removal of an apparatus for repair in the workshop:

Device isolated and flushed

Pre-flushed when installed (e.g. demineral. Water)

Maintain article-specific data: Type of machine/apparatus/article, last content/substance(s), dangerous goods?

Removal of the device

Marking Blinding

Transport note/doc for (internal) transport: Data on dangerous good(s), safety instructions, flushing condition, etc.

Internal Transport to the washing/cleaning area



Flushing/cleaning of the machine/article

Updated transport note: If necessary cleaning medium/solvent, flushing condition, residual contamination, safety instructions

Transport to internal workshop

Decision about repair or maintenance, internal or external



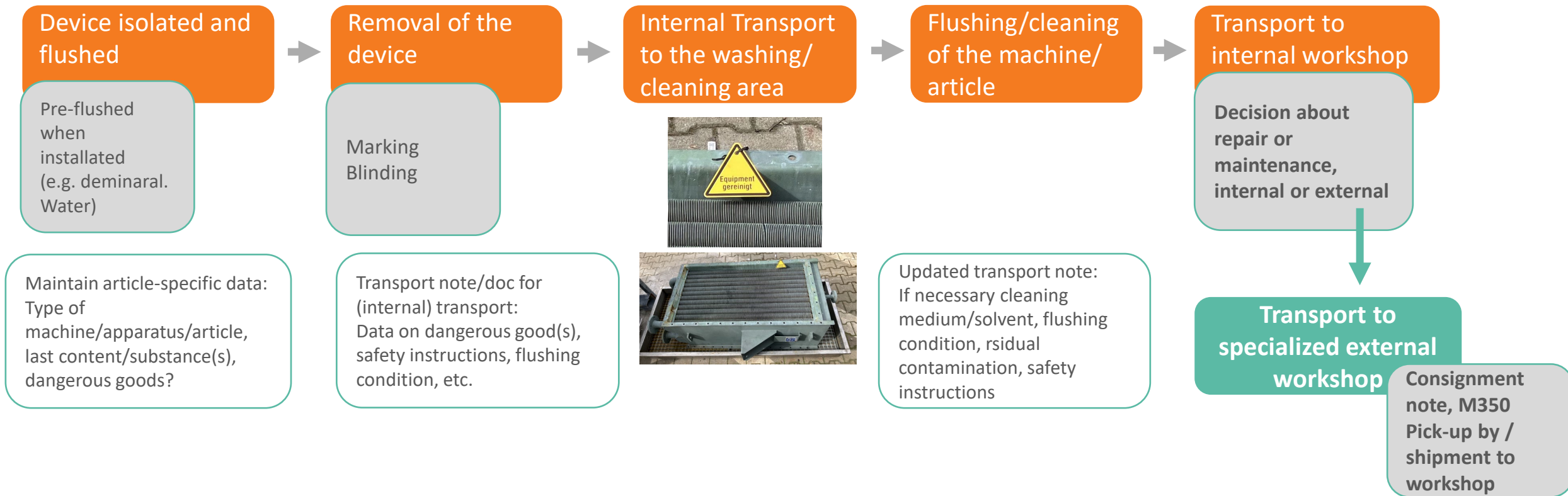
Decision about maintenance/repair in internal or external workshop



Dangerous Goods in Machines, Apparatus or Articles

Example for an industrial process for contaminated apparatus: maintenance in the workshop

Removal of an apparatus for repair in the workshop:



Safe transport with required documents



Challenges with the Application of ADR Regulations for Machinery, Apparatus and Articles containings Dangerous Goods without an exemption

- Industry very much welcome the use of UN numbers 3363 and 3537 – 3548
- However for various special cases, e.g. contaminated used components/parts, it poses considerable challenges for industry, craftsmen, workshops, assembly companies due to the special conditions, including:
 - In-depth knowledge of dangerous goods legislation required
 - Classification of substances and mixtures in machinery, apparatus and articles necessary
 - Quantities of dangerous goods contained can only be estimated
 - Quantities allowed for UN 3363 are low and vary depending on DG classification
 - Restriction by the fact that dangerous goods or residues of these goods must be an integral part of the object and necessary for its function and may not be removed for transport purposes
 - Observe of requirement in SP 301 and packaging provisions 907 or P006 and LP003
 - No further exemptions for UN 3537-3548 foreseen
 - Risk of non-compliance due to non-observance or incorrect application of the rules (e.g. due to only occasional shipment or unintentional incorrect estimation of the quantity) or even non-observance
- For such cases from the practice it means a significant economic burden without a visible safety advantage



Thank you.

Contact:

Gerhard Bruss, BASF SE, +49 174 3198044
gerhard.bruss@basf.com

Imre Elek, CEFIC, +32 496 26 24 70
iel@cefic.be



About Cefic

Cefic, the European Chemical Industry Council, founded in 1972, is the voice of large, medium and small chemical companies across Europe, which provide 1.1 million jobs and account for 15% of world chemicals production. Cefic members form one of the most active networks of the business community, complemented by partnerships with industry associations representing various sectors in the value chain. A full list of our members is available on the Cefic website. Cefic is an active member of the International Council of Chemical Associations (ICCA), which represents chemical manufacturers and producers all over the world and seeks to strengthen existing cooperation with global organisations such as UNEP and the OECD to improve chemicals management worldwide

