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ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

Working Party on the Transport of Dangerous Goods

Joint Meeting of Experts on the Regulations annexed to the
European Agreement concerning the International Carriage
of Dangerous Goods by Inland Waterways (ADN)
(ADN Safety Committee)

Fifteenth session
Geneva, 24-28 August 2009
Item 5 of the provisional agenda

CATALOGUE OF QUESTIONS

Chemicals - practice, objectives 1, 2, 3, 4

Transmitted by the Central Commission for the Navigation of the Rhine (CCNR)¹

1. At its fourteenth session, the ADN Safety Committee, recalling that, under 8.2.2.7.2.3 of the Regulations annexed to ADN, the ADN Administrative Committee was required to prepare a catalogue of questions for the ADN examinations, decided that the item should be put on the agenda for future sessions, in order to enable lists of questions to be translated and adopted progressively (ECE/TRANS/WP.15/AC.2/30, paras. 38 and 40).

¹ Distributed in German by the Central Commission for the Navigation of the Rhine under the symbol CCNR/ZKR/ADN/WP.15/AC.2/2009/25.

2. This document contains the lists of questions proposed by CCNR in respect of knowledge of practices for the chemicals examination:

- Examination objective 1: Measurements
- Examination objective 2: Sampling techniques
- Examination objective 3: Cleaning of cargo tanks
- Examination objective 4: Working with cargo residues (slops), cargo remains and residual cargo tanks

PRACTICE
Examination objective 1: Measurements

Number	Source	Correct answer
CP 101	What is the maximum permissible concentration at the work place? A A legal requirement B A recommendation from the manufacturer of the dangerous substance C A recommendation of ECE D A recommendation from a “gas” expert	A
CP 102	The maximum permissible concentration at the work place is accompanied by an “S”. What is the meaning of this “S”? A The abbreviation of the country where the limit value at the work place is applicable B The toxic substance can be absorbed by the skin C The value is permitted D The substance can cause skin disease	B
CP 103	A gas measurement test tube is marked “n=10”. What does this mean? A The margin for error of measurement with this test tube is 10% B To obtain an exact value, 10 measurements should be taken C To carry out a measurement, 10 pumps should be done with the toximeter D The measured value should be multiplied by 10	C
CP 104	Under normal conditions, what is the oxygen content of air? A 17% B 19% C 21% D 22%	C

PRACTICE
Examination objective 1: Measurements

Number	Source	Correct answer
CP 105	<p>You want to determine whether there are explosive gases in a cargo tank. In this case, is the amount of oxygen important as well?</p> <p>A Yes, the measurement is based on a combustion process. The amount of oxygen influences the result</p> <p>B No, when the oxygen content is under 21% in the space to be measured, no explosive mixture can form</p> <p>C No, flammable gas measurement meters work independently of oxygen content</p> <p>D No, the measurement must be taken outside the space to be measured. Therefore, the oxygen content is of no importance</p>	A
CP 106	<p>When an explosive mixture is measured, there is always a safety margin of 20% under the lower explosive limit. Why?</p> <p>A Because the explosive limit is highly dependent on the temperature and humidity in the cargo tank</p> <p>B To ensure that the gas concentration to be measured is indeed under the lower explosive limit, a large safety margin is observed</p> <p>C So that even when the voltage is too weak (nearly empty battery) a reliable measurement can still be taken</p> <p>D Because when the oxygen content changes the gas mixture is not immediately able to explode</p>	B
CP 107	<p>You have to check whether a cargo tank contains toxic gases. Where do you go to measure the highest toxic gas concentrations?</p> <p>A It depends on the relative density of the gas. The density indicates whether the highest concentration is at the top or the bottom of the cargo tank</p> <p>B The concentration is always the same throughout the cargo tank. There is no highest concentration</p> <p>C At the top of the cargo tank, as toxic gas is always lighter than air</p> <p>D At the bottom of the cargo tank, as toxic gas is always heavier than air</p>	A

PRACTICE
Examination objective 1: Measurements

Number	Source	Correct answer
CP 108	<p>The value of the maximum permissible gas concentration at the work place is accompanied by a “C”. The “C” is an abbreviation for what?</p> <p>A “Carbon”; the maximum permissible concentration of hydrocarbons at the work place</p> <p>B “Country”; the country where this maximum permissible concentration at the work place is applicable</p> <p>C “Ceiling”; this maximum permissible concentration at the work place may in no case be exceeded</p> <p>D “Carcinogenic”; the substance causes cancer</p>	C
CP 109	<p>The value of the maximum permissible concentration at the work place is accompanied by “TGG-15”. What does this mean?</p> <p>A That the weighted average time can be considered only after a period of 15 minutes</p> <p>B That the value of the maximum permissible concentration at the work place may not be exceeded for more than 15 minutes</p> <p>C That the value of the maximum permissible concentration at the work place must have the same value for at least 15 minutes</p> <p>D That the value of the maximum permissible concentration at the work place is applicable only if work must be done with this substance for more than 15 minutes</p>	B
CP 110	<p>What is the list of value assessments for the maximum permissible concentration at the work place?</p> <p>A An assessment list established internationally</p> <p>B An assessment list established at the European level</p> <p>C An assessment list established at the national level</p> <p>D A non-binding assessment list</p>	C

PRACTICE
Examination objective 1: Measurements

Number	Source	Correct answer
CP 111	What must you do when you want to measure explosive vapours using a flammable gas concentration meter in a cargo tank?	A
	A Take into account the oxygen content or the result will not be reliable	
	B Simply take the measurement, as the oxygen content is not important	
	C Measure the toxicity or the result will not be reliable	
	D First measure the oxygen content and the toxicity or the result will not be reliable	
CP 112	A measurement test tube bears the mark “n=10”. What does this mean?	D
	A The test tube may be reused after 10 minutes	
	B The vapour should be left to act for 10 minutes before the result is read	
	C The result of the measurement should be read within a maximum of 10 minutes	
	D To obtain a reliable result 10 pumpings are required	
CP 113	The maximum permissible concentration is calculated for what period per 24 hours?	C
	A 4 hours	
	B 6 hours	
	C 8 hours	
	D 12 hours	
CP 114	What is the meaning of 1 ppm?	A
	A 1 par per million parts	
	B 1 part per mass	
	C 1 part per metric tonne	
	D 1 part per milligram	

PRACTICE
Examination objective 2: Sampling techniques

Number	Source	Correct answer
CP 201	1.2.1 What is the correct description of a partly closed sampling device? A A device penetrating through the boundary of the cargo tank such that during sampling only a small quantity of gaseous or liquid cargo can escape into the open air B A device penetrating through the boundary of the cargo tank but constituting a part of a closed system designed so that during sampling no gas or liquid may escape from the cargo tank C A device composed of an opening with a diameter of not more than 0.30 m fitted with a self-closing flame arrester D A device with which the substance under pressure is released into the test tube by a reduction valve	A
CP 202	3.2, Table C The kind of sampling device that should be used for sampling is specified where? A ADN, Part 1 B ADN, Part 3 C The certificate of approval D The instructions in writing	B
CP 203	7.2.4.22.4 A sample is taken through an open sampling device. For what safety reason should a nylon string never be used? A The string might break under the effect of the substance B The cylinder may slip from the nylon string C The use of a nylon string may result in an electrostatic charge D The use of nylon string is prohibited by occupational safety provisions	C

PRACTICE
Examination objective 2: Sampling techniques

Number	Source	Correct answer
CP 204	3.2, Table C Following loading with UN No. 2486 ISOBUTYL ISOCYANATE, a sample must be taken. What kind of device must be used, at the very least? A An open sampling device B A closed-type sampling device C A closed-type sampling device with a pressure-release lock chamber D A partly closed sampling device	D
CP 205	3.2, Table C After loading with UN No. 1203 MOTOR SPIRIT or GASOLINE or PETROL, a sample must be taken. What kind of device must be used, at the very least? A An open sampling device B A closed-type sampling device C A closed-type sampling device with a pressure-release lock chamber D A partly closed sampling device	A
CP 206	3.2, Table C, 7.2.4.16.8, 8.1.5 What protective equipment must be worn during sampling with a closed-type sampling device? A None, as a closed-type device is being used B Depending on the cargo, the same as used in other work during loading and unloading C Only a breathing apparatus D Unknown, as no measurement has been taken	B
CP 207	1.2.1 You take a sample using a partly closed sampling device. How are the air and vapour that were in the test tube evacuated? A Through the loading pipe B By returning to the cargo tank C To the open air, through a discharge pipe D Through a vapour pipe of the vessel	C

PRACTICE
Examination objective 2: Sampling techniques

Number	Source	Correct answer
CP 208	3.2, Table C	A
	<p>Some substances must be carried in type C tank vessels. What kind of sampling device should not be used for such substances?</p> <p>A An open-type sampling device B A partly closed sampling device C A closed-type sampling device D A closed-type sampling device with a lock chamber</p>	
CP 209	7.2.4.22.3	B
	<p>When must you wait 10 minutes before taking a sample?</p> <p>A Always B When an open-type sampling device is used C When a partly closed sampling device is used D Only when flammable liquids are involved</p>	
CP 210	3.2, Table C	D
	<p>When must a closed-type sampling device be used on vessels?</p> <p>A When they are carrying substances for which marking with one blue light or cone is required B When they are carrying substances for which marking with two blue lights or cones is required C When they are carrying substances for which marking with a blue cone or light is not required D When they are carrying substances for which the equipment in question is required in Table C</p>	
CP 211	7.2.4.22.3	C
	<p>Under ADN, sample openings may not be opened until 10 minutes after the loading has been interrupted. Why?</p> <p>A Because the pressure is reduced only after 10 minutes B Because the liquid in a cargo tank reaches a reasonable temperature only after 10 minutes C Because a possible electrostatic charge would be discharged only after 10 minutes D Because the safety measures can be taken only after 10 minutes</p>	

PRACTICE
Examination objective 2: Sampling techniques

Number	Source	Correct answer
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CP 212	1.2.1	A
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What is the purpose of a closed-type sampling device?

- A Prevent the release of gas into the environment
- B Remove the least possible liquid from the cargo
- C Reduce evaporation, which means a loss of cargo, to a minimum
- D Obtain a pure sample

PRACTICE
Examination objective 3: Cleaning of cargo tanks

Number	Source	Correct answer
CP 301	7.2.3.4 After unloading, a type-C tank vessel has to clean its cargo tanks. You are given a cleaning product with the following physical properties: boiling point 161° C, melting point <-40° C, flash point 36° C. Can you use it? A Yes, according to ADN the use of cleaning products with a flash point <55° C is allowed in the cargo area B No, a cleaning product with the above physical properties has no grease diluting properties and is thus unsuitable for use as a cleaning product C No, according to ADN cleaning products should not be used to clean type-C tank vessel cargo tanks D No, according to ADN a cleaning product must have a flash point >60° C	A
CP 302	What does it mean if a product is in the group of cleaning products known as “saponifying”? A It is a base used as a cleaning product for tanks B It is a product that through a chemical reaction transforms an oily product into a soapy emulsion C It is a synthetic cleaning product D It is a device that, by adding water, transforms solid soap into liquid soap	B
CP 303	Sodium hydroxide (caustic acid) is what kind of cleaning product? A A detergent B An emulsifying agent C A saponifying agent D A synthetic cleaning product	C

PRACTICE
Examination objective 3: Cleaning of cargo tanks

Number	Source	Correct answer
CP 304	What name is given to the machines commonly used to clean tanks in inland navigation? A “Butterwash” machines B Centrifugal sprinklers C Nebulizers D Type-C sprinklers	A
CP 305	7.2.3.44 Liquids with a flash point under 55° C are used for cleaning. Where can such products be used? A In the engine room B Only in the cargo area C Only in the cargo tanks D Only on the deck, both in the cargo area and outside it	B
CP 306	What risk is to be avoided in steam cleaning a cargo tank in an explosive atmosphere? A Heating of the cargo tank B Oxidation C Increase in gas concentration D Electrostatic charge	D
CP 307	What is a detergent? A A mixture of cleaning products B An emulsifying agent C A synthetic soap D A solvent	A
CP 308	Deleted	

PRACTICE
Examination objective 3: Cleaning of cargo tanks

Number	Source	Correct answer
CP 309	The vessel was loaded with non-water-soluble substances. When the cargo tanks are cleaned, attention should be paid to: A Use external water for the cleaning so as to minimize the harmful effect on the environment B Hermetically close the cargo tank during cleaning to minimize the harmful effect on the environment C The temperature of the deck on the cargo tanks. If the deck becomes too hot it can affect the coating of the cargo tanks D Ensure that the spray reaches all parts of the cargo tank	D
CP 310	Deleted	
CP 311	What is the only type of hose that may be used for cleaning cargo tanks? A A reinforced pressure-resistant hose B A heat-resistant hose, because of the high temperatures C A special tank-cleaning hose, to eliminate electrostatic charges D A synthetic hose, to avoid corrosion	C
CP 312	After the cargo tank has been cleaned, it is ascertained that there are no more dangerous gases in the tank. Six hours later a new measurement is taken and a dangerous concentration is found. Why might this happen? A Very low boiling point B Very low melting point C Very low vapour density D Very low vapour pressure	D

PRACTICE
Examination objective 3: Cleaning of cargo tanks

Number	Source	Correct answer
CP 313	Why are vapour pipes fitted with heating devices?	C
	A Because they facilitate cleaning of the cargo tanks	
	B Because they have been tested for the products for which they are used	
	C To avoid crystallization of certain products	
	D For the automatic cleaning of the vapour pipes	
CP 314	In cleaning a cargo tank, the least possible water should be used. Why?	A
	A To protect the environment	
	B It is better for the cargo tank walls	
	C Because some products react with water	
	D So that the soap concentration is as high as possible	
CP 315	Before connecting the tank cleaning machine, the supply hoses should be rinsed thoroughly with water. Why is this necessary?	B
	A To bring the hoses to the right temperature	
	B To prevent detritus in the hoses from entering the tank cleaning machine	
	C To see if the hoses are blocked	
	D To see if the hoses have leaks	
CP 316	The cleaning method and duration depend on:	A
	A The product, and the material and design of the cargo tank	
	B The authorization of the competent authority	
	C The authorization of the cleaning company	
	D The viscosity of the cleaning product used	
CP 317	Deleted	

PRACTICE
Examination objective 3: Cleaning of cargo tanks

Number	Source	Correct answer
CP 318	You have to clean cargo tanks that were loaded with substances that crystallize quickly. To what should you pay particular attention? A If the vapour pipes and fittings systems are not insulated or heated they may clog B The tank cleaning machine's operating system may become damaged by the formation of small crystals C In winter the crystals evaporate quickly, which could thus result in an explosive mixture D Crystals are solids that should not be in the cleaning company's storage tank	A
CP 319	7.2.3.1.5 Under ADN, what concentration of gas is acceptable for a person to enter a cargo tank to clean it? A Not more than 50% of the lower explosive limit B Not more than 40% of the lower explosive limit C Not more than 20% of the lower explosive limit D Not more than 10% of the lower explosive limit	A
CP 320	When a cargo tank is being steam cleaned, apart from the risk of electrostatic charge, what else requires attention? A That no cavitation should occur in the cargo tank B That no overpressure should occur in the cargo tank C That no cold water should enter the cargo tank D That no cleaning product should enter the steam	B
CP 321	The duration of steam treatment required to clean a cargo tank depends on: A The hardness of the water and the steam pressure B The cleaning products and the hardness of the water C The cleaning products and the state of the cargo tank D The substance that is later to be loaded	C

PRACTICE
Examination objective 3: Cleaning of cargo tanks

Number	Source	Correct answer
CP 322	7.2.3.1.6	C
	Is a rescue winch required when a person enters a cargo tank to clean it?	
	A No, a rescue winch is never required	
	B Yes, a rescue winch is always required	
	C Yes, a rescue winch is required if there are just three persons on board	
	D Yes, a rescue winch is required if there are just two persons on board	
CP 323	After gas-freeing and cleaning of a cargo tank, the slops not suitable for pumping must be removed. What requires your attention in this case?	B
	A Ensure there are enough pails available	
	B Be aware that the slops may release gases	
	C Ensure the tank cleaning device is kept at a distance	
	D Be aware that the slops may be poured into a residual cargo tank	
CP 324	Class 3 slops not suitable for pumping have to be removed from a cargo tank. What devices may be used?	A
	A Only devices that do not produce sparks	
	B Only devices specifically designed for the task and authorized by the European Union	
	C Any devices	
	D Only devices specifically designed for the task and authorized by ECE	
CP 325	During the cleaning of a tank, an explosive mixture is formed. What should you do?	A
	A Immediately suspend cleaning and degas the tank	
	B Reduce the spray pressure to generate less gas	
	C Increase the spray pressure so that the vapours can more quickly escape from the cargo tank	
	D Open the tank lid so that the gas can better escape	

PRACTICE
Examination objective 3: Cleaning of cargo tanks

Number	Source	Correct answer
CP 326	<p>The cargo tanks have been emptied of a Class 3 substance. While sailing, you clean the cargo tanks. There are two people on board. You want to remove slops not suitable for pumping from a cargo tank that has not been entirely degassed. A rescue winch is prepared, and it is manned by a person keeping watch. Can you enter the cargo tank?</p> <p>A Yes, if the appropriate protection measures are taken B No, during navigation no one may enter the cargo tanks C No, at least one more person able to lend assistance in an emergency must be within calling distance D No, at least two other people able to lend assistance in an emergency must be within calling distance</p>	C
CP 327	<p>You want to clean the cargo tanks. Where is cleaning allowed?</p> <p>A Only in port B Only on the river C The location does not matter D Only during navigation</p>	C

PRACTICE**Examination objective 4: Working with cargo residues (slops), cargo remains and residual cargo tanks**

Number	Source	Correct answer
CP 401	9.3.2.22.4, 9.3.2.26.4 ADN stipulates that each cargo tank or group of cargo tanks must be fitted with a connection for the safe return ashore of gases expelled during loading. This system is called the “vapour pipe”. Does a residual cargo tank also have to be connected to a vapour pipe? A No, except for the time when the residual cargo tank is being filled B Yes, always C Yes, but only if there is actually residue in the residual cargo tank D Yes, but only if the residual cargo tank has no ullage opening fitted with a flame arrester	A
CP 402	Why is it advisable to separate glycols and alcohols from other substances when storing them in residual cargo tanks? A Glycols and alcohols are too fatty. They cannot later be separated from the other substances B Glycols and alcohols are highly water soluble. They therefore have a high pollution load C Glycols and alcohols react with water. Such reactions are not dangerous D Glycols and alcohols are not water soluble. They therefore have a high pollution load	B
CP 403	You want to pump two different products into the same residual cargo tank. You should make sure that: A The products have the same identification number B The products have the same name C The products neutralize one another D The products do not react with one another	D

PRACTICE
Examination objective 4: Working with cargo residues
(slops), cargo remains and residual cargo tanks

Number	Source	Correct answer
CP 404	9.3.2.26.3	C
	What is the maximum capacity of the residual cargo tank?	
	A 10 m ³	
	B 20 m ³	
	C 30 m ³	
	D 50 m ³	
CP 405	9.3.2.26.2	D
	Is it necessary to be able to close slops tanks with lids?	
	A No, but they must be fire resistant	
	B No, but they must be marked and easy to handle	
	C Yes, but only when the capacity is greater than 2 m ³	
	D Yes	
CP 406	7.2.4.1.1, 9.3.2.26.1	C
	Intermediate bulk containers (IBCs), tank-containers or portable tanks may be used instead of fixed residual cargo tanks. What is the maximum capacity authorized for such IBCs, tank-containers or portable tanks?	
	A 0.20 m ³	
	B 1.00 m ³	
	C 2.00 m ³	
	D 30.00 m ³	
CP 407	9.3.2.26.1	B
	Does a type-C tank vessel have to have a residual cargo tank?	
	A Yes, a residual cargo tank with a minimum capacity of 30 m ³	
	B Yes, a residual cargo tank with a maximum capacity of 30 m ³	
	C Yes, six residual cargo tanks with a minimum capacity of 2 m ³ each	
	D Yes, six residual cargo tanks with a maximum capacity of 2 m ³ each	

PRACTICE**Examination objective 4: Working with cargo residues
(slops), cargo remains and residual cargo tanks**

Number	Source	Correct answer
CP 408	Where can you put cleaning waste water and slops? A Any unloading berth B Any loading berth C Only locations authorized by the competent authority D Any refuelling station	C
CP 409	7.2.3.7.5 The master decides that the blue cone can be removed. Should the residual cargo tank too be free from gases? A Yes, as the residual cargo tank is one of the cargo tanks, and the cargo tanks must be free from gases (less than 20% of the lower explosive limit) B Yes, as a residual cargo tank that is not free from gases is a hazard C No, as no gas can be expelled from a residual cargo tank D No, as according to ADN it is only in the cargo tanks that gases must be under 20% of the lower explosive limit	D
