PUBLIC REVIEW DRAFT

Transport of dangerous goods by rail — Operational and design requirements and emergency preparedness

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TC REPRESENTATION

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Department of Defense

ICT fire and rescue

AAR Healthcare Kenya Ltd

Kenya Red Cross

Avenue healthcare

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Kenya Council for Emergency Medical Technicians

Ministry of transport

Kenya Railways

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FOREWORD

This Kenya Standard was prepared by the Disaster Management Technical Committee under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards (KEBS)

This standard specifies the requirements for the safe transport of dangerous goods by rail in terms of operational requirements, design requirements and emergency preparedness. It also gives different responsibilities of the operator, consignor and the consignee. This includes classification, packaging, documentation, loading, dispatch, placarding, contingency planning and incident management , offloading, security issues and training

Scope 1.1

This standard specifies the requirements for the safe transport of dangerous goods by rail in terms of:

a) operational requirements;

b) design requirements; and

c) emergency preparedness.

1.2 This includes classification, packaging, documentation, loading, dispatch, placarding, contingency planning and incident management , offloading, security issues and training.

2. Reference

SANS 10405:2014 - Transport of dangerous goods by rail - operational and design requirements and emergency preparedness

KS 2324:2014 - The identification and classification of dangerous goods for transport

KS 2530:2014 - Transport of dangerous goods- packaging and large packaging for road and rail transport

KS 2384:2014 - Transport of dangerous goods —Operational requirements for road vehicles

KS 2382-1, *Transport of dangerous goods – Emergency information systems – Part 1: Emergency information system for road transport*

3 Definitions and abbreviations

For the purposes of this document, the following definitions apply.

3.1 Definitions

3.1.1 approved inspection authority

as defined in the relevant national legislation

3.1.2 competent authority

national body or authority, designated, or otherwise recognized for the control or regulation of a particular aspect of the transport of dangerous goods

3.1.3 consignee

person who has been designated to receive dangerous goods that have been transported

NOTE: If the consignee designates a third party in accordance with the provisions applicable to the contract for transport, this person is deemed to be the consignee. If the transport operation takes place without a contract for transport, the person who takes ownership of the dangerous goods on arrival is deemed to be the consignee.

3.1.4 consignment

package or packages or loads of dangerous goods presented by a consignor for transport

3.1.5 consignment

note and wagon label document containing information in terms of the contract for transport of any package or packages, or load of dangerous goods presented by a consignor for transport by rail

3.1.6 consignor

person who offers dangerous goods for transport, including the product manufacturer, product owner or an agent appointed as such

3.1.7 container

freight container, intermediate bulk container, portable tank and bulk container

3.1.8 de-energize

disconnect an electrical circuit from its source

3.1.9 notionally empty wagons or containers

empty uncleaned wagons or containers that previously carried dangerous goods that may still contain residue

3.1.10 portable tank

multimodal tank used for the transport of dangerous goods of class 1 and classes 3 to 9, comprising of a shell fitted with service equipment and structural equipment necessary for the transport of dangerous goods and capable of being filled and discharged without removal of the structural equipment

3.1.11 receptacle

means of a containment vessel used for receiving and holding dangerous goods which is fitted with a means of closure

3.1.12 rolling stock

vehicle that is able to operate on a railway irrespective of its capability of independent motion

3.1.13 segregation

loading of compatible products of different classes or divisions (as specified in KS 2324 in separate areas within wagons, freight containers or multi-compartment tanks and pressure vessels

3.1.14 service worthy

rolling stock that is technically sound, with or without prescribed conditions or restrictions

NOTE Any conditions or restrictions imposed on one vehicle in a consist for whatever reason, apply to the whole consist. Vehicle loads should conform to loading specifications.

3.1.15 tank

tank-container, portable tank, tank-wagon, and demountable tank, including its service and structural equipment

3.1.16 tank-container

article of transport equipment, with a capacity of more than 450 L, meeting the definition of a container and comprising a shell and items of equipment, including the equipment to facilitate movement and handling used for the transport of gases, liquid, powdery or granular substances

3.1.17 tank-wagon

wagon intended for the transport of liquids, gases, powdery or granular substances, which operates either at atmospheric pressure or elevated pressure, comprising a superstructure, consisting of one or more shells and an under-frame fitted with its own items of equipment including running gear, suspension, buffing, traction, braking gear and inscriptions

NOTE "Tank-wagon" also includes wagons with demountable tanks

3.1.18 United Nations number (UN No.)

serial number assigned to dangerous goods by the United Nations Committee of Experts on the transport of dangerous goods

3.1.19 vehicle list wagon

list document containing information relating to the wagons and load on a train

3.1.20 wagon rail

vehicle without its own means of propulsion and includes flatbed wagon, open wagon, closed wagon, tank wagon, and multi-compartment tank wagon

3.1.21 waste

substances, solutions, mixtures or articles for which no direct use is envisaged but that are carried for reprocessing, dumping, elimination by incineration or other methods of disposal

4 Responsibilities of the consignor, train operator and consignee

4.1 General

4.1.1 The consignor, train operator and consignee involved with the transport of dangerous goods by rail shall take appropriate measures according to the nature and the extent of foreseeable risk, in order to avoid and mitigate the potential damage that may arise from such transport, or minimize the damage to property and the environment or injury to people. The consignor, train operator and consignee shall, in all respects, comply with the requirements of this standard within their respective areas of responsibility.

4.1.2 When there is an immediate threat that could jeopardize public safety, parties involved shall take the necessary steps to avoid, minimize and mitigate such a threat, including the immediate notification of the emergency services and by making available to them any information including documentation as given in **4.3.1.1, 4.3.3, 4.4.3, 4.4.7** and clause 5, which they may require in order to take appropriate action.

4.1.3 For damaged, leaking or contaminated packages, the following shall apply:

a) Dangerous goods shall not be offered or accepted for transport or continued to be transported if it is evident that a package is damaged or leaking or if it is suspected that a package may have leaked or been damaged.

b) Access to the package shall be restricted until the extent of the risk to health, environment, property and the rolling stock has been assessed. The scope of the risk assessment shall include examination of the package and examination of the loading areas and adjacent vicinity. If the dangerous goods are already on the wagon or container, the assessment shall also include other wagons and containers on the train;

c) In the event that a damaged or leaking package is observed during the offloading operation, the assessment shall also include the offloading facilities, area and adjacent areas.

d) The loading, transport or offloading activity (or both) may only proceed once appropriate measures have been put in place to avoid or prevent and mitigate such risk and that the package is safe to be handled or transported.

e) Where the consignment cannot be loaded, transported or unloaded, the damaged, leaking or contaminated wagon or container shall be stored or staged, as the case may be, in a safe location until the risks have been mitigated and the dangerous goods are safe to be handled or transported.

4.1.4 The consignor, operator and consignee shall ensure that they comply with the requirements of the relevant national legislation regarding environmental management

4.1.5 The consignor, operator and consignee shall have contingency plans in place in accordance with the requirements of national guidelines for transportation of dangerous (find out if its).

4.1.6 If a third party is used, appropriate measures shall be taken to ensure that all the requirements of this standard are met. The relevant consignor, train operator or consignee shall take full responsibility and accountability for the actions of the third party.

4.1.7 Rail siding(s) shall comply with the following:

a) Loading and offloading of dangerous goods in rail sidings is not permitted under overhead track equipment (either Alternating current (AC) or Direct Current (DC)) on a railway network unless the entire section of railway line, from point set to point set, is de-energized;

b) During loading and offloading of dangerous goods, the minimum distance from the point of loading or **decanting** to the nearest electrified line is based and determined by the prevailing risk established by the operator;

c) The requirements for earthing and bonding in rail sidings is implemented under these circumstances in accordance with relevant requirements ; and

d) All earthing and bonding equipment including insulated rail joints, bonds and earth connections at sidings are inspected, maintained and repaired on a regular basis as per the operator's maintenance program.

4.2 Training

4.2.1 General awareness training

4.2.1.1 The consignor, train operator and consignee shall ensure that employees involved with the transport of dangerous goods by rail receive dangerous goods awareness training commensurate with their duties. Each employee shall receive training designed to provide familiarity with the general provision of dangerous goods transport.

4.2.1.2 Training shall include:

a) identification of the classes of dangerous goods and their related hazards;

b) identify the marking, labeling, and placarding of dangerous goods;

c) packaging, handling and equipment;

d) segregation and compatibility requirements;

e) documentation; and

f) emergency response, procedures for accident avoidance and proper use of personal protective equipment.

4.2.2 Functional specific training Employees shall receive detailed training commensurate with the duties they perform including:

a) description and classification of the classes of dangerous goods;

b) packaging requirements;

c) labeling and marking requirements;

d) safe handling procedures;

e) compatibility and segregation of the consignment on a wagon;

f) separation and compatibility of wagons transporting dangerous goods;

g) placarding;

h) rolling stock suitability and service worthiness;

i) loading and offloading;

j) incident management including contingency planning and emergency preparedness;

k) railway operators interfacing with train operators transporting dangerous goods;

l) relevant documentation including consignment note and wagon label, vehicle list and Safety Data Sheets (SDS);

m) wagon and consignment inspections during transit; and

n) shunting related work.

4.3 Responsibilities of the consignor

4.3.1 Classification and packaging

4.3.1.1 Classification:- The consignor shall ensure that dangerous goods offered for transport are classified in accordance with KS 2324:2014. When the classification of a dangerous goods product is uncertain, the consignor shall provide the train operator with additional information in the form of a Safety Data Sheet and, if required, test results that support the assumed classification.

4.3.1.2 Packaging:- The consignor shall ensure that dangerous goods offered for transport are packaged and labeled in accordance with KS 2530:2014 as relevant. Dangerous goods to be transported in (intermediate bulk containers) IBCs shall comply with relevant requirements.

4.3.2 Requirements for loading Processes and procedures shall be established, developed or adopted, documented and maintained by the consignor for the management of loading. In addition the consignor shall ensure that:

a) loading of dangerous goods shall only be undertaken by competent persons wearing appropriate personal protective equipment;

b) the area is safe for the loading operations and where necessary barricades are erected and appropriate warning signs are clearly displayed in terms of the relevant national legislation

4.3.3 Waste classification confirmation The consignor shall classify waste offered for transport that contains any material listed as dangerous goods in KS 2324:2014 and which exceeds the exempt quantity, as listed in KS 2384:2014, either by itself or a combination of other materials. Written proof of such classification shall be made available to the operator and to the authorities on request

4.3.4 Precautions with respect to food products, for human consumption and animal feeds

4.3.4.1 The consignor shall ensure that food products and dangerous goods are not loaded together into the same wagon or container;

4.3.4.2 Food products shall not be loaded into a wagon or container that had previously carried dangerous goods until the wagon or container has been decontaminated and certified as such.

4.3.5 Loading of gas cylinders

The consignor shall ensure that:

a) cylinders are appropriately secured to prevent the load from shifting;

b) cylinders are loaded to stand vertically

c) gas containers with a maximum product capacity of 9 kg may be stacked vertically and not more than two cylinders high.

4.3.6 Documentation

4.3.6.1 Conditions of carriage

The consignor and the train operator shall agree on the conditions of carriage for the transport of dangerous goods.

4.3.6.2 Consignment note and wagon label

Prior to the transport of dangerous goods, the consignor shall hand over the consignment note and wagon label to the train operator. This shall contain at least the following information:

a) the UN number;

b) the proper shipping name;

c) class of dangerous goods, and where applicable, the classification code as provided for in terms of the relevant national legislation for substances and articles of class 1;

d) where assigned, the packing group allocation;

e) the quantity and a description of the load;

NOTE 1 An example of such a description is:

(a) UN 1098; (b) ALLYL ALCOHOL; (c) 6.1; (d) 'I', (e) 25 drums", which combined read as follows: UN 1098 ALLYL ALCOHOL 6.1 I 25 drums.

NOTE 2 The location, layout and order in which the elements of information required appear in the consignment note are optional, except that (a), (b), (c), (d) and (e) should be shown in sequence.

f) with the exception of empty unclean containers, the total quantity of each type of dangerous goods bearing a different UN number, either as a volume or as a gross mass, or as a net mass as appropriate;

g) with regard to the transportation of waste, the following information shall be included in the consignment note and wagon label:

(i) waste generator, waste manager, product owner and product custodian in terms of the relevant legislation

(ii) the origin or source of the waste (process or activity that generated the waste);

(iii) waste classification;

(iv) type of waste management applied (re-use/recycling/recovery/treatment/disposal);

(v) discrepancies in information (waste quantity, type, classification, physical and chemical properties); and

h) the name and address of the consignee(s);

i) a declaration by the consignor of any special arrangements required for the handling, packaging and transport of dangerous goods;

j) goods packed in exempt quantities require no additional information. The term “EXEMPT QTY” shall be included in the vehicle list with the description of the dangerous goods being transported. In the event of more than one class compatible dangerous goods in excess of the exempt quantity being carried, the requirements of 5.3 shall apply;

k) for empty uncleaned wagons which contain the residue of dangerous goods of classes other than class 7 including empty uncleaned receptacles for gases with a capacity of not more than 1000 L, the description on the consignment note shall be "EMPTY PACKAGING", "EMPTY RECEPTACLE", "EMPTY IBC", "EMPTY LARGE PACKAGING” or EMPTY TANK WAGON", as appropriate, followed by the information of the dangerous goods last loaded;

l) the consignor shall declare in writing that the contents of the consignment offered for transport are fully and accurately described by their proper shipping names, and that they are correctly classified, packaged and marked.

m) the consignment note and wagon label are acceptable (see also annex B); and n) the use of electronic data processing (EDP) or electronic data interchange (EDI) instead of paper documentation is permitted, provided that the data produced is at least equivalent to that of paper documentation.

4.3.7 Placarding

4.3.7.1 General

4.3.7.1.1 The consignor shall be responsible for placarding and shall ensure that placarding of the wagons or containers are at all times an accurate reflection of the dangerous goods to be transported.

4.3.7.1.2 Placards shall be clearly visible and legible.

4.3.7.1.3 Placards shall be designed and displayed in accordance with the requirements of KS 2382-1.Dedicated wagons or containers may display placards in terms of:

a) KS 2382- 1; or

b) the appropriate hazard warning label and either the UN number or the shipping name; For (b) above, the specification regarding size and colour shall be in accordance with KS 2382- 1

4.3.7.1.4 The placards shall be affixed to the containment area of the wagons, tanks, pressure vessels, freight containers or IBCs. They may be fixed directly or supported by means of a permanently fixed frame.

4.3.7.1.5 The placarding affixed to a wagon or container containing dangerous goods of more than one class need not bear a subsidiary risk.

4.3.7.1.6 A wagon or container carrying dangerous goods of a single hazard class but of different response requirements in terms of the Emergency Response Guide (ERG) as described in KS 2382- 3 shall be placarded "MIXED LOAD" in the goods identification zone and the relevant hazard class diamond in the hazard class diamond zone of the placard.

4.3.7.1.7 A wagon and container transporting dangerous goods of a single hazard class and of the same response requirements contained in the ERG shall display the United Nations number (UN No.) of the most hazardous substance in the dangerous goods identification zone and the hazard class diamond relevant to it in the hazard class diamond zone of the placard. Mixed loads of this nature shall be placarded as for single loads.

4.3.7.1.8 A wagon or container carrying dangerous goods of more than one compatible hazard class shall be placarded "MIXED LOAD" or “MULTI-LOAD” in the goods identification zone and “DANGEROUS” in the hazard class diamond zone.

4.3.7.1.9 Petroleum-based products such as diesel (UN 1202), petrol (UN 1203), kerosene (UN 1223) and aviation fuel (UN 1863) may be placarded with the generic UN No. 1203, either singularly or as a mixed load. Wagons or containers dedicated to any of these products shall use the appropriate UN No.

4.3.7.2 Wagons

4.3.7.2.1 Placards shall be displayed on both sides of wagons.

4.3.7.2.2 Appropriate placards shall be displayed along each side at the position of the relevant compartments of multiple compartment tank wagons carrying two or more dangerous goods. Identical placards need only be displayed once along each side.

4.3.7.3 Freight and tank containers on flatbed wagons

4.3.7.3.1 Freight and tank containers shall carry placards.

4.3.7.3.2 Placards shall be displayed on both sides and on both ends of the freight container and tank-container.

4.3.7.3.3 Where the transport of freight containers includes a sea leg or movement across borders, split placards shall be displayed on such containers transported by rail in accordance with the IMDG Code Split placards and shall consist of a goods identification rectangle, the

appropriate hazard class diamond and subsidiary risk diamond(s) where applicable, or a mixed load diamond.

4.3.7.3.4 Multiple compartment wagons, tanks, or freight containers carrying two or more compatible dangerous goods, shall be placarded with the appropriate placards along each side at the position of each compartment containing the relevant product and one placard for each product on both ends.

4.3.7.3.5 Where containers are loaded on wagons other than flatbed wagons, the requirement in 4.3.7.2.1 shall apply.

NOTE NO additional placards are required for **flatbed wagons** loaded with freight containers or tanks carrying dangerous goods.

4.3.7.4 Explosives (class 1)

4.3.7.4.1 Compatibility divisions shall not be indicated on placards if the wagon, tank, freight container and IBCs are carrying substances or articles belonging to two or more compatible groups. Wagons, tanks and freight container carrying substances or articles of different divisions shall bear placards conforming to the hazard class of the most dangerous division in the order 1.1 (most dangerous), 1.2, 1.3, 1.4, 1.5, 1.6 (least dangerous). **4.3.7.4.2** Wagons, tanks and freight containers carrying 1.5 D substances or articles of division 1.2, shall be placarded as division 1.1.

4.3.7.5 Fumigated wagons

4.3.7.5.1 The transport of wagons, tanks and freight containers which have been fumigated shall display UN No. 3359 and the consignment note shall show the date of fumigation and the type and amount of the fumigant used. In addition, instructions for disposal of any residual fumigant including fumigation devices (if used) shall be provided.

4.3.7.5.2 A warning sign shall be placed at the point of entry on each fumigated wagon, tank and freight container in a location where it will be easily seen.

4.4 Responsibilities of the train operator

4.4.1 The train operator shall ensure that the rolling stock or containers supplied to the consignor for loading:

a) are suitable for the product to be transported;

b) are in a service worthy condition; and

c) include instructions for loading.

4.4.2 The train operator shall ensure that dangerous goods accepted for transport comply with the following requirements:

a) the consignment note and wagon label as declared by the consignor in accordance with 4.3.6.2 accurately reflect the dangerous goods to be transported and shall be displayed on each wagon;

b) establish with reference to 4.3.2 (i), that the wagons or containers have not been overloaded or overfilled and where required, the load is appropriately secured and covered;

c) placards are correctly displayed in accordance with 4.3.7; and

d) the wagons or containers are free from any visible dangerous goods spillage that could have a detrimental effect on people, property, the wagon or container, the remainder of the consignment, or the environment.

4.4.3 The train operator shall ensure that at marshalling yards:

4.4.3.1 Processes and procedures are developed or adopted, documented and maintained to ensure that wagons and containers containing dangerous goods and **notionally** empty wagons and containers are:

a) shunted, marshaled, or coupled with utmost caution;

b) not detached from a shunting movement until it has been brought to a standstill;

c) separated by at least one wagon either empty or loaded with non-dangerous goods from the locomotive during shunting operations;

d) not fly shunted;

e) accordingly identified during shunting;

f) restricted in length according to the perceived risk;

g) shunted in accordance with the permissible speed limits as determined by the operator;

h) not shunted unnecessarily and such movements are limited;

4.4.4 The train operator shall establish, develop or adopt, document and maintain processes and procedures for shunting and marshalling of wagons containing dangerous goods and notionally empty wagons and containers at hump facilities. These procedures and processes shall ensure that:

a) wagons containing explosives are not shunted at these facilities;

b) risk assessments and emergency planning takes place on a continual basis as appropriate, taking into account changes in operational and other activities around and within the yard;

c) wagons and containers and notionally empty wagons and containers are not staged for extended periods of time unnecessarily;

d) placards on loaded and notionally empty wagons and containers are a true reflection of the dangerous goods contained in these wagons or containers;

e) the consignment note displayed on loaded and notionally empty wagons or containers are a true reflection of the dangerous goods to be or being transported;

f) the compatibility requirements of annex A are complied with for trains staged adjacent to and next each other;

g) all wagons and containers are monitored for spillages, leaks and any defects on a continual basis;

h) the lighting requirements comply with the relevant national legislation and

i) records of all dangerous goods staged at the yard at any one time are available.

4.4.5 The train operator shall ensure that prior to departure:

a) visual examination is carried out to ensure the integrity of the wagons and container or load;

b) where more than one class of dangerous goods (mixed load) is transported the load conforms to the requirements of the loading compatibility chart (see annex A);

c) the wagons and containers are separated by a minimum distance of 18 m from wagons and containers carrying non-compatible dangerous goods;

d) wagons carrying dangerous goods are separated from the locomotive by at least 18 m. One wagon containing general freight is placed at the end of the train;

e) for transport of explosives, wagons or containers loaded with explosives comply with the requirements of the relevant national legislation

f) the vehicle list accurately reflects the dangerous goods to be transported; and

g) wagons or containers that have transported dangerous goods retain their placards until they have been cleaned, degassed or decontaminated and certified clean;

4.4.6 The train operator shall ensure that in-transit monitoring is undertaken, thus, regular checks are made during transit to ensure the continued service worthiness of wagons or containers and where possible, the integrity of the load is maintained. If during transit, non-

compliance or an unsafe condition is observed which could either jeopardize the safety of train operations or impact on the environment, the train is stopped, and only continues when the non-compliance or unsafe condition has been rectified and it is safe to proceed.

4.4.7 The train operator shall ensure that contingency planning and occurrence reporting is done and a 24 h contact number for receiving and providing information on the transport of dangerous goods is available and communicated to relevant operator personnel, emergency services and other operators along the routes on which dangerous goods is transported.

4.4.8 A continuous review shall be done, or whenever there is a significant change in commodities and classes or quantities of dangerous goods intended to be transported, and the emergency services along the route shall be informed accordingly.

4.4.9 The train operator shall ensure the safety of wagons containing dangerous goods or notionally empty wagons and containers passing through tunnels and stations. Safety processes and procedures for passing through the tunnels and stations shall be developed or adopted, documented and maintained. These processes and procedures shall include risk assessments which shall take place on a continual basis as appropriate, taking into account the following:

a) the dangerous goods to be transported through tunnels and stations;

b) any visible spillages that may have occurred during transit;

c) train parameters including length of train, speed, height and stopping and staging of trains;

d) emergency response needs; and

e) other trains travelling through tunnel and stations at the same time

4.5 Responsibilities of the consignee

4.5.1 The consignee shall be responsible for the offloading of dangerous goods unless otherwise agreed.

4.5.2 The consignee shall establish, develop or adopt, document and maintain processes and procedures for the offloading of dangerous goods unless otherwise agreed.

4.5.3 The consignee shall:

a) verify that the dangerous goods being received are in accordance with the consignment note and wagon label;

b) verify that the consignment is not damaged and there is no obvious spillage or leakage. If there is evidence of spillage, leakage or damage that would adversely impact on human health, the environment or the wagon, the consignee shall inform the train operator and, where

appropriate, consult with the emergency services. The consignor and the competent authority shall decide on actions to be taken. Where required the consignment shall be secured and placed in a safe location pending a decision regarding the offloading;

c) ensure that the offloading operations are carried out by trained personnel;

d) ensure that all the necessary equipment for the safe offloading of the dangerous goods is in proper working condition;

e) ensure that where the wagon or container cannot be certified as clean, the consignment note and wagon labels are affixed to the wagon and placards are not removed from the wagon or container; and

f) in the case of bulk deliveries, in addition to the requirements in (a) to (f) (inclusive):

(i) there is sufficient space in the tanks or bins into which the load is to be offloaded and that such tanks and bins are in a fit condition to receive the load;

(ii) the valves and hatches can be closed immediately in case of leakage or any other emergency;

(iii) after offloading, the wagon is free from spillage and that all valves and hatches are closed;

(iv) in the case of delivery of a part load, the remaining load is properly secured;

(v) minimum residue remains in the wagon or container; and

(vi) the operator is informed of any consignment or part thereof that has not been unloaded.

5 Design requirements, security and exemptions

5.1 Design requirements

5.1.1 General

The train operator shall ensure that wagons used to transport dangerous goods comply with the design requirements of the relevant national legislation.

5.1.2 Vessels under pressure

5.1.2.1 Design of new tank wagons and tank-containers

5.1.2.1.1 Tank wagons and tank-containers shall be designed according to internationally recognized wagon or container design standards or codes, including:

b) UIC (International Union of Railways).

NOTE Any wagons and tank-containers designed should comply with the interoperability and compatibility requirements.

5.1.2.1.2 Tank wagons and tank-containers may also be designed according to any of the approved standards or codes for the design of vessels in accordance with the relevant national legislation, subject to the following additional requirements to address train dynamics:

a) the dynamic loads imposed on the pressure vessel and its supports and fittings;

b) stability of the wagon and tank-container either on their own or as a combination thereof; and
c) the protection of shells and fittings in the case of an accident.

NOTE Requirements in respect of (a), (b) and (c) above are published in internationally recognized wagon design standards including those of the UIC.

5.1.2.2 Existing wagons

5.1.2.2.1 Where existing wagons do not strictly comply with the requirements of 5.1.2.1, sound engineering practice shall be applied to validate and verify the integrity of the wagons for continued or extended use.

5.1.2.2.2 The continued or extended use of tank wagons shall be formalized by a certificate of continuance issued by relevant.

5.1.3 Non-pressurized tank wagons and general freight wagons. The design of all other rolling stock used to convey dangerous goods on an adhoc or permanent basis shall be in accordance with internationally recognized wagon design standards or codes including those of the UIC.

5.2 Security

5.2.1 The consignee, train operator and consignor shall establish, develop or adopt, document and maintain processes and procedures to deal with issues relating to security.

5.2.2 The consignor, consignee, train operator shall ensure compliance with the relevant national legislation regarding security issues.

5.2.3 The consignor, train operator and consignee shall ensure that:

5.2.3.1 Personnel are adequately trained to deal with security issues.

5.2.3.2 High consequence dangerous goods as declared in the relevant national legislation shall be identified and special attention shall be given to ensure safe transport;

5.2.3.3 Security plans shall be developed and implemented when necessary, including:

a) specific allocation of responsibilities to competent personnel with appropriate authority;

b) records of dangerous goods transported;

c) review of current operations and assessment of security risks including:

(i). stops en route;

(ii) storage of dangerous goods in wagons or containers for long period of time;

(iii) delays in en route; and

(iv) operating practices.

d) effective up-to-date procedures for reporting incidents, threats or breaches of security;

e) procedures for evaluating and testing of security plans;

f) measures to secure certain information;

g) communication plans;

h) measures and procedures to prevent and identify losses and theft.

5.2.4 In addition, the train operator shall ensure compliance with the relevant requirements. given in

5.3 Exemptions

5.3.1 General

The provisions laid down in this standard do not apply to:

a) Dangerous goods carried by a passenger where the goods in question are packaged for retail sale and are intended for personal, domestic, leisure or sporting activities; or

NOTE: Dangerous goods packed in IBCs, large packaging's or tanks should not be considered to be packaged for retail sale.

b) Gases and liquid fuels contained in tanks affixed to vehicles and equipment intended for its operation, subject to the fuel cock between the gas tank and the engine being closed and the electric contact open, where applicable.

5.3.2 Exempt quantities

5.3.2.1 The requirements of this standard do not apply to items with the same UN number if the total quantity transported is less than the quantity (in kg or L, as appropriate) indicated in the exempt quantity list given in KS 2384:2014

5.3.2.2 For a mixed load, if no single item of dangerous goods in the load exceeds the quantity (in kg or L, as appropriate) given in KS 2384:2014 the following calculation shall be done for each item of dangerous goods in the load to determine if the total exceeds 1 000 kg or L as calculated below.

$A = Q \times F$

where A is the mass or volume of exempted quantity in kilograms or litres, as applicable;

Q is the quantity of the dangerous goods being transported, in kilograms or litres, as applicable; and F is the factor shown in exempt quantity list in KS 2384:2014.

If the sum of A for all the calculations does not exceed 1 000 kg or L, the requirements of this standard do not apply

6. Emergency preparedness

An Emergency Response Plan (ERP) is required to meet the requirements of Transport of Dangerous Goods by the Rail. A well developed ERP could prevent a minor incident from escalating to a disaster, save lives, prevent injuries, and minimize damage to property and the environment.

Objectives of an emergency response plan

a) To minimize any adverse effects on people, damage to property or harm to the environment in a transport emergency;
b) To facilitate a rapid and effective emergency response and recovery;
c) To provide assistance to emergency and security services; and
d) To communicate vital information to all relevant persons involved in the transport emergency (both internal personnel and external agencies) with a minimum of delay.

6.1 Planning

The following elements should be considered when preparing a Emergency Response Plan, Plan activation, response tasks, resources and preparedness.

A ERP shall prepare institutions/agencies for the unexpected by identifying response mechanisms to a variety of potential crises arising from the transport of dangerous goods.

6.1.1 It shall outlines the necessary resources, personnel, and logistics which allow for a prompt, coordinated, and rational approach to a transport incident.

6.1.2 The plan shall contain sufficient detail to enable those involved in the response to effectively carry out their duties.

6.1.3 The plan shall also take in to consideration requirements of the Regulations and Rail Rules.

6.1.4 Every plan shall have a stated policy, purpose, and organizational structure, geographic scope, and contain details of the classes of dangerous goods and mode of transport.

A finished plan does not ensure readiness. Continual appraisal using table-top and simulation exercises, plus regular updating of equipment, contact lists, and training of personnel will improve the capability to successfully respond to transport emergency situations. Liaison with

emergency and, where relevant, security services in the planning phase is a critical element in the development of the plan. This may include communication with emergency and/or security services along the transport route.

6.2 Plan activation

6.2.1 Internal alerting mechanism

The plan should describe how transport emergency calls are processed within the organisation and how appropriate response personnel in a position of authority will activate and implement the plan.

6.2.2 Situation Appraisal

A checklist shall be developed for recording essential information about the incident to facilitate decision making;

a) date, time, location,
b) nature of the incident,
c) likely or possible causes of the incident (such as collision with another vehicle or object, equipment failure, sabotage or attack), injuries,
d) type of container involved, placard, label, and manifest details,
e) weather conditions, terrain,
f) personnel on site,
g) amounts of dangerous goods and other materials involved, etc.

A comprehensive checklist will assist in gathering as much information as possible during the initial call.

6.2.3 Authority and resources mobilization

The plan shall identify specific positions within an organisation (preferably by name) and their scope of authority.

These shall include:-

a. the person in charge within the organisation, the chain of command, technical and medical advisors and their areas of expertise,

b. on-scene authority for organisation, spokesperson(s) including public relations and media person

c. who will be responsible for requesting outside assistance.

6.3 Response tasks

6.3.1 The plan shall describe how and when the organisation will alert external parties such as emergency services, fire authorities, police, security services, environment protection authorities, competent authorities, road authorities and outside contractors.

6.3.2 Appropriate measures shall be described for each material to be handled in a manner which will minimize danger and the impact on the environment including initial emergency action, containment, recovery and cleanup.

6.3.3 Equipment location, capability, and limitations to be used shall be described.

6.4 Resources

6.4.1 The plan shall contain an accurate, up-to-date telephone roster for emergencies which may include individuals within the organisation, regulatory contacts, containment and cleanup equipment contractors, technical specialists, public health and environment protection authorities including alternates and respective telephone / facsimile numbers. (The contact list may be included as an annex to the ERP to facilitate updating.)

6.4.2 The plan shall describe the communication network to be used and provide clear operational procedures for the use of mobile phones, radios and other communication devices.

6.4.3 The plan shall describe the movement of people and equipment to and from the emergency site. This becomes an important aspect if the transport incident occurs in a remote location.

6.4.4 An inventory of emergency response equipment shall be maintained. Detailing a list of specific resources and items of equipment available from within the organisation, and externally,

6.4.6 Contractors personnel and equipment shall be evaluated in advance. for expertise and capabilities

6.4.7 The plan shall designate response personnel, and describe their duties. Each person must be fully aware of his or her role.

6.4.8 A designated media contact shall serve to assist in relaying important information between the organisation and the media.

6.5 Preparedness

Multiple plans may be required depending on a hazard analysis of possible scenarios.

6.5.1 Training

An emergency situation often provides an unfamiliar, emotional and hostile working environment for the responders. Anyone with little training or experience will have difficulty dealing effectively with the incident.

6.5.1.1 Training shall provide the capability for rapid and competent response, vital to success in an emergency situation.

6.5.1.2 All personnel who have an active role in the plan shall be trained in the key aspects of the plan.

6.5.2 Exercises

Table-top and simulation exercises allow the plan to be scrutinized under conditions which approximate an actual incident.

6.5.2.1 Assessment shall be done in stages whereby one specific aspect of the plan is evaluated at a time.

6.5.2.2 Interaction with external agencies such as consignors, prime contractors and the emergency services shall be included in evaluating the overall plan after completing “in-house” full scale incident scenarios

6.5.3 Maintenance of response equipment

The plan should show schedules for preventative maintenance of relevant equipment listed in the plan.

The plan should also show the system by which the maintenance schedules are met.

6.5.4 Investigative follow up

The overall response shall be evaluated to determine the effectiveness of the plan.

The ERP shall then be updated and modified as necessary.

6.5.5 Updating

A nominated individual should be responsible for updating the plan (including contact telephone numbers) and informing all plan holders of any changes.

A record of plan amendments shall be maintained.

The plan should be updated at least annually.

6.5.6 Plan availability and distribution

The plan should include a listing of all recipients, their names, addresses and title.

The plan should be accessible to all staff who have responsibilities within the emergency plan .

Annex A (normative)

General provisions and load compatibility chart for dangerous goods

A.1 General

A.1.1 The requirements in force at the dispatching station shall be complied with for the loading of goods, unless any special requirements are prescribed in this annex for certain substances.

A.1.2 Packages shall be so loaded in wagons that they cannot shift dangerously, overturn or fall.

A.1.3 The interior and exterior of a wagon or container shall be inspected prior to loading to ensure that there is no damage that could affect its integrity or that of the packages to be loaded into it.

A.2 Mixed loading prohibition

A.2.1 Packages bearing different danger labels shall not be loaded together in the same wagon or container unless mixed loading is permitted based on the danger labels they bear.

A.2.2 The mixed loading prohibitions for packages shall also apply to the loading of packaged and small containers and the mixed loading of small containers in a wagon or large container in which small containers are carried.