

## NR 9 - ENVIRONMENTAL RISK PREVENTION PROGRAM

### Publication

GM Ordinance no. 3.214 of June 8<sup>th</sup>, 1978

### D.O.U.

06/07/78

### Amendments/Updates

SSST Ordinance no. 25 of December 29<sup>th</sup>, 1994

30/12/94

MTE Ordinance no. 1.297 of August 13<sup>th</sup>, 2014

14/08/14

MTE Ordinance no. 1.471 of September 24<sup>th</sup>, 2014

25/09/14

MTb Ordinance no. 1.109 of September 21<sup>st</sup>, 2016

22/09/16

MTb Ordinance no. 871 of July 6<sup>th</sup>, 2017

07/07/17

*(Text given by SSST Ordinance no. 25 of December 29<sup>th</sup>, 1994)*

### 9.1 Objective and scope of application.

**9.1.1** This Regulatory Norm - NR establishes the obligation to prepare and implement the Environmental Risk Prevention Program - PPRA by all employers and institutions that hire workers as employees, aimed at preserving the health and integrity of employees through anticipation, recognition, evaluation and control of the environmental risks that exist or will exist in the workplace by taking the protection of the environment and natural resources into consideration.

**9.1.2** The PPRA's activities shall be developed within each establishment of the enterprise under the responsibility of the employer, with participation by workers, and its breadth and depth depending on the characteristics of the risks and control needs.

**9.1.2.1** The PPRA may be summarized to the steps provided in subsection "a" and "f" in item 9.3.1 when environmental risks are not identified in the anticipation or recognition phases as described in item 9.3.2 and 9.3.3.

**9.1.3** The PPRA is part of a broader set of the enterprise initiatives in the field of preserving the health and integrity of employees and shall be linked with the provisions of other NRs, especially with Medical Occupational Health Control Program (PCMSO) provided for in NR-7.

**9.1.4** This NR establishes the minimum parameters and general guidelines that are to be observed in implementing the PPRA, and these could be ex-

tended through a collective bargaining agreement.

**9.1.5** For the purposes of this NR, the physical, chemical and biological agents in the work environment which are capable of causing harm to workers' health, due to their nature, concentration or intensity and exposure time, are considered as environmental risks.

**9.1.5.1** Physical agents are considered to be the various forms of energy that workers may be exposed to, such as noise, vibration, abnormal pressures, extreme temperatures, ionizing radiation, non-ionizing radiation, as well as infrasound and ultrasound.

**9.1.5.2** Chemical agents are considered to be substances, compounds or materials that could enter the body through a respiratory route in the form of dusts, fumes, mists, gases or vapors or which, by the nature of the activity of exposure, could have contact or be absorbed into the body through the skin or ingested.

**9.1.5.3** Bacteria, fungi, bacilli, parasites, protozoa, viruses, and others are considered biological agents.

**9.2** The structure of the PPRA.

**9.2.1** The Environmental Risk Prevention Program shall, at the minimum, contain the following structure:

- a) annual planning establishing goals, priorities and schedules;
- b) strategy and methodology of activities;
- c) form of registration, maintenance and publishing of data;
- d) frequency and form of evaluating the development of the PPRA.

**9.2.1.1** A comprehensive analysis of the PPRA shall be effected, whenever necessary and at least once a year, for evaluating its development and implementing necessary adjustments and establishing new goals and priorities.

**9.2.2** The PPRA shall be described in a report containing all the structural aspects found in item 9.2.1.

**9.2.2.1** The report and its amendments and supplements shall be presented and discussed in the CIPA, if one exists in the enterprise, in accordance with NR-5 with a copy attached to the minutes book of that Commission.

**9.2.2.2** The report and its amendments shall be available for immediate access for the relevant authorities.

**9.2.3** The schedule provided for in item 9.2.1 shall clearly indicate the deadlines for developing the steps and fulfilment of the goals for the PPRA.

**9.3** The PPRA's Development.

**9.3.1** The Environmental Risk Prevention Program shall include the following steps:

- a) anticipation and recognition of risks;
- b) establishment of priorities and goals for evaluation and control;
- c) risk and exposure assessments;
- d) implementation of control measures and evaluation of their effectiveness;
- e) monitoring exposure to risks;
- f) record keeping and dissemination of data.

**9.3.1.1** The PPRA's preparation, implementation, monitoring and evaluation may be done by Specialized Services in Occupational Safety and Health - SESMT or by a person or a team of people, at the discretion of the employer, who are able to develop any provision in this NR.

**9.3.2** The anticipation shall involve the analysis of projects of new facilities, work methods or processes, or modifications of existing ones, in order to identify potential risks and introduce protective measures to reduce or eliminate them.

**9.3.3** Recognition of environmental risks shall contain the following items, as applicable:

- a) their identification;
- b) determination and location of possible sources;
- c) identification of possible ways of dissemination of agents in the workplace;
- d) identification of functions and determination of the number of workers exposed;
- e) characterization of activities and type of exposure;
- f) collection of existing data in the enterprise that indicate any possible health impairment resulting from the work;
- g) possible health effects related to the identified risks available in the technical literature;
- h) description of existing control measures.

**9.3.4** A quantitative evaluation shall be carried out whenever necessary in

order to:

- a) prove the exposure control or the absence of risks identified in the recognition step;
- b) scale the exposure of workers;
- c) support the equation of control measures.

### **9.3.5 Control measures.**

**9.3.5.1** Necessary measures sufficient to eliminate, minimize or control environmental risks shall be adopted whenever one or more of the following is verified:

- a) identification of potential health risk during the anticipation phase;
- b) any findings in the recognition phase of an evident health risk;
- c) when the results of quantitative evaluations of values for worker exposure exceed the limits in NR-15 or, in the absence of these limits occupational exposure values adopted by the American Conference of Governmental Industrial Hygienists (ACGIH), or those that may be established in collective bargaining in the workplace, if more stringent than the technical-legal criteria;
- d) when the causal link between the damage observed in the health of the workers and the work situation to which they are exposed, are characterized through the medical examination.

**9.3.5.2** The study, development and implementation of collective protection measures shall conform to the following hierarchy:

- a) measures that eliminate or reduce the use or the formation of agents that are hazardous to health;
- b) measures to prevent the release or dissemination of these agents in the workplace;
- c) measures to reduce the levels or concentrations of these agents in the workplace.

**9.3.5.3** The implementation of collective measures shall be strictly followed by workers' training regarding the procedures which ensure their effectiveness and information pertaining to the possible limitations of protection they offer.

**9.3.5.4** When the employer or institution proves that it is technically unfeasible to adopt collective protection measures, or if they are not sufficient, or are in the planning, implementation or complementary or emergency stage, other measures shall be adopted that adhere to the following hierarchy:

- a) administrative controls or work organization measures;
- b) use of personal protective equipment- PPE.

**9.3.5.5** The use of PPE under this program shall take existing legal and administrative standards into account and, at the minimum, involve the following:

- a) selecting PPE that is technically appropriate for the risk which the worker is exposed to and the activity performed, considering the effectiveness necessary to control the exposure to risk and the comfort offered according to the evaluation of the user;
- b) training workers on its proper use and guidance on the limitations of the protection offered by the PPE;
- c) establishing rules or procedures to promote the provision, use, storage, cleaning, conservation, maintenance and replacement of PPE in order to ensure the protection conditions originally established;
- d) characterization of the functions or the activities of the workers, with respective identification of PPE used for environmental risks.

**9.3.5.6** The PPRA shall establish criteria and procedures for assessing the effectiveness of the protective measures that have been implemented considering the data obtained in the evaluations and medical examinations provided in NR-7.

**9.3.6** Action level.

**9.3.6.1** For the purposes of this NR, the action level is considered to be the value over which preventive actions should be initiated in order to minimize the probability that employee exposures to environmental agents will exceed the exposure limits. The actions shall include the periodic monitoring of exposure, information to the workers and medical surveillance.

**9.3.6.2** The conditions that present occupational exposure above the action levels shall be subject to systematic control, as indicated in the following lines:

- a) for chemical agents, half of the occupational exposure limits in accordance with subsection "c" of sub-item 9.3.5.1;
- b) for noise, a dose of 0.5 (greater than 50%) according to the criteria in item 6 of Annex I in NR-15.

**9.3.7** Monitoring.

**9.3.7.1.** In order to monitor worker exposure and control measures, a systematic and repeatable assessment of exposure to any given risk shall be performed that seeks to introduce or modify control measures whenever necessary.

### **9.3.8** Record keeping.

**9.3.8.1** A record of data that is structured in a way as to provide the technical and administrative history of the PPRA's development shall be maintained by the employer or institution.

**9.3.8.2** The data shall be maintained for a minimum period of 20 (twenty) years.

**9.3.8.3** The database shall always be readily available to interested workers or their representatives and the relevant authorities.

### **9.4** Responsibilities.

#### **9.4.1** Employer:

I. to establish, implement and ensure compliance with the PPRA as a permanent activity by the enterprise.

#### **9.4.2** Employees:

I. collaborate and participate in the implementation and execution of the PPRA;

II. follow the guidance received in training provided within the PPRA;

III. inform of any occurrences which may lead to risks for workers' health, in their judgement, to their direct superior.

### **9.5** Information.

**9.5.1** The workers concerned shall have the right to submit proposals and receive information and guidance in order to ensure protection from the environmental risks identified in the PPRA's implementation.

**9.5.2** Employers shall inform workers in an appropriate and sufficient manner of the environmental risks that may arise in the workplace and of the means available to prevent or limit such risks and to protect themselves from said risks.

### **9.6** Final provisions.

**9.6.1** Whenever several employers undertake simultaneous activities at the same workplace, they shall have a duty to perform integrated actions to implement the measures provided in the PPRA with a view towards protecting all workers exposed to environmental risks.

**9.6.2** The knowledge and the perception that the workers have on the work process and existing environmental hazards, including those reflected in the Risk Map established in NR-5, shall be considered for the planning and implementation of PPRA in all its stages.

**9.6.3** The employer shall ensure that, upon the occurrence of environmental risks in the workplace that pose imminent and serious danger to one or more workers, they may immediately interrupt their activities and communicate the fact to the direct supervisor for the necessary arrangements.

## **ANNEX 1 VIBRATION**

*(Approved by MTE Ordinance no. 1.297 of August 13<sup>th</sup>, 2014)*

Contents:

1. Objectives
2. General Provisions
3. Preliminary Assessment of Exposure
4. Quantitative Assessment of Exposure
5. Preventive and Corrective Measures

### **1. Objectives**

**1.1** To establish criteria for the prevention of diseases and disorders resulting from occupational exposure to the Hand-Arm Vibration (HAV) and Whole-Body Vibration (WBV) within the Environmental Risk Prevention Program.

## **2. General Provisions**

**2.1** Employers shall adopt measures to prevent and control exposure to mechanical vibrations that could affect the safety and health of workers, eliminating the risk or, where there is no proven technology available, reducing it to the lowest levels possible.

**2.1.1** Physical exertions and postural aspects, among other things, shall be considered in the process of eliminating or reducing risks related to exposure to mechanical vibrations.

**2.2** Employers shall prove the adoption of effective measures to control and reduce exposure to vibrations within the actions of preventive and corrective maintenance of vehicles, machinery, equipments and tools.

**2.3** Vibrating hand tools that produce accelerations greater than  $2.5\text{m/s}^2$  in the hands of the operators shall inform of the technical specifications of vibration emitted by those hand tools, indicating the testing standards that were used for the measurement.

## **3. Preliminary Assessment of Exposure**

**3.1** Preliminary assessment of exposure to HAV and WBV shall be conducted within the context of risk recognition and evaluation, considering the following aspects:

- a) work environments, processes, operations and exposure conditions;
- b) characteristics of the machines, vehicles, equipment or tools for the job;
- c) information provided by the manufacturers regarding vibration levels generated by tools, vehicles, machinery or equipment;
- d) conditions of use and state of repair of vehicles, machinery, equipment and tools, including isolation and cushioning components or devices that limit exposure for operators or drivers;
- e) ground conditions, characteristics of transported loads and operating speeds, in the case of WBV;
- f) estimated duration of daily exposure;
- g) specific working conditions that may contribute to worsening the effects of exposure;
- h) physical exertions and postural aspects;
- i) existing data of occupational exposure;
- j) information or records relating to medical history and complaints related to exposed workers.



**3.2** The results of the preliminary assessment shall subsidize the adoption of preventive and corrective measures, notwithstanding any other measures provided in the other NRs.

**3.3** If the preliminary assessment is not sufficient to make decisions regarding the need to implement preventive and corrective measures, a quantitative assessment shall be conducted.

#### **4. Quantitative Assessment of Exposure**

**4.1** The quantitative evaluation shall be representative of the exposure, covering organizational and environmental aspects that involve the workers throughout the course of their duties.

**4.1.1** The procedures for quantitative evaluation of exposure to HAV and WBV that are to be adopted within the scope of this Annex are those laid down in the Occupational Hygiene Standards published by FUNDACENTRO.

#### **4.2 Quantitative evaluation of exposure to HAV**

**4.2.1** The evaluation of occupational exposure to hand-arm vibration shall be made using methods and apparatus that allow the determination of the resulting acceleration of exposure normalized ( $a_{ren}^1$ ), a parameter representing the daily exposure of the worker.

**4.2.2** The action level for evaluating daily occupational exposure to hand-arm vibration corresponds to a value of resulting acceleration of exposure normalized ( $a_{ren}$ ) of 2,5 m/s<sup>2</sup>.

**4.2.3** The daily occupational exposure limit for hand-arm vibration corresponds to a value of resulting acceleration of exposure normalized ( $a_{ren}$ ) of 5 m/s<sup>2</sup>.

**4.2.4** Occupational exposure situations above the action level, regardless of the use of personal protective equipment, imply mandatory adoption of preventive measures, notwithstanding the provisions of item 9.3.5.1 of NR-9.

**4.2.5** Occupational exposure situations above the exposure limit, regardless of the use of personal protective equipment, imply mandatory adoption of corrective measures, notwithstanding the provisions of item 9.3.5.1 in NR-9.

---

<sup>1</sup> Nota do Tradutor: **aren** is equivalent to the terms  $a_{hv(eq,8h)}$  and A(8) used in International standards.

### 4.3 Quantitative evaluation of exposure to WBV

**4.3.1** The evaluation of occupational exposure to whole body vibrations shall be made using methods and apparatus that allow the determination of the resulting acceleration of exposure normalized (aren), and of the Resulting Vibration Dose Value (VDVR<sup>2</sup>), parameters representing the daily exposure of the worker.

**4.3.2** The action level for evaluating daily occupational exposure to whole body vibration corresponds to a value of resulting acceleration of exposure normalized (aren) of 0,5 m/s<sup>2</sup>, or the Resulting Vibration Dose Value (VDVR) of 9,1 m/s<sup>1,75</sup>.

**4.3.3** The daily exposure limit for whole body vibration corresponds to:

- a) value of the resulting acceleration of exposure normalized (aren) of 1,1 m/s<sup>2</sup> ; or
- b) Resulting Vibration Dose Value (VDVR) of 21,0 m/s<sup>1,75</sup>.

**4.3.3.1** For the purposes of exposure characterization, the employer shall prove the assessment of the two parameters described above.

**4.3.4** Occupational exposure situations above the action level require mandatory adoption of preventive measures, notwithstanding the provisions of item 9.3.5.1 of NR-9.

**4.3.5** Occupational exposure situations above the occupational exposure limit require mandatory adoption of corrective measures, notwithstanding the provisions of item 9.3.5.1 in NR-9.

## 5. Preventive and Corrective Measures

**5.1** Preventive measures shall include:

- a) Periodic assessment of exposure;
- b) Guidance for the workers about the risks arising from exposure to vibration and appropriate use of work equipments, as well as the right to notify their superiors of abnormal vibration levels observed during their activities;
- c) Health surveillance focused on the effects of exposure to vibration;
- d) Adoption of procedures and alternative work methods that reduce

---

<sup>2</sup> Nota do Tradutor: **VDVR** is equivalent to the term VDVsum (root-sum-of-quads) in ms<sup>-1.75</sup>.

any exposure to mechanical vibrations.

**5.1.1** The preventive measures described in this item do not exclude other measures that may be deemed necessary or advisable depending on the particularities of each work condition.

**5.2** The corrective measures shall include at least one of the following measures, complying with the hierarchy provided in NR-9:

a) In case of exposure to HAV, modification of process or work operation, which may involve: replacement of tools and accessories; redesign or reorganization of benches and workstations; changing the routines or work procedures; suitability of the type of tool, of the accessory used and of the operating speeds;

b) In case of exposure to WBV, modification of process or work operation, which may involve: redesigning of work platforms; redesigning, reorganizing or changing the routines or work procedures and organization; suitability of the vehicles used, especially by the adoption of anti-vibration seats; the improvement of conditions and the characteristics of the floors and pavements used for movement of machinery and vehicles;

c) Reducing duration and intensity of the daily exposure to vibration;

d) Alternation of activities or operations that generate exposure to higher levels of vibration with others that involve exposure to lower levels of vibration.

**5.2.1** The corrective measures mentioned above do not exclude other measures that may be deemed necessary or advisable depending on the particularities of each work condition.

**6.** *(Deleted by MTE Ordinance no. 1.471 of September 24<sup>th</sup>, 2014)*

## **ANNEX 2**

*(Approved by MTb Ordinance no. 1.109 of September 21<sup>st</sup>, 2016)*

### **OCCUPATIONAL EXPOSURE TO BENZENE AT GAS STATIONS**

Contents:

1. Objective and Field of Application
2. Responsibilities
3. Workers' Rights
4. Internal Commission on Accident Prevention - CIPA

5. Workers' Training
6. Medical Occupational Health Control Program - PCMSO
7. Environmental Assessment
8. Operational Procedures
9. Operational Activities
10. Annex Workplaces
11. Uniforms
12. Personal Protective Equipment - PPE
13. Signage referring to Benzene
14. Collective Control of Exposure during filling

## **1. Objective and Field of Application**

**1.1** This annex establishes the minimum occupational health and safety requirements for activities involving occupational exposure to benzene at Gas Stations - GS containing this substance. These requirements shall complement the requirements and guidelines already provided for in the existing Occupational Safety and Health (OSH) laws in Brazil.

**1.1.1** For the purposes of this Annex, "Gas Stations" GS means any establishment located on land that resells, in retail, automotive fuels and supplies fuel tanks for land vehicle or packages certified by INMETRO.

## **2. Responsibilities**

**2.1** It is the employer's responsibility to:

**2.1.1** Comply with and enforce this Annex.

**2.1.2** Solely permit contracting services from other companies provided that the contract states the obligation to comply with the OSH measures established in this annex.

**2.1.2.1** The GS shall align existing service provision agreements with the provisions in this norm.

*(Check deadline on MTb Ordinance no. 1.109 of September 21<sup>st</sup>, 2016)*

**2.1.3** Halt any type of activity that exposes workers to conditions that pose an imminent and serious danger to their safety or health.

**2.1.4** Provide information to contracted companies on potential risks and preventive measures for exposure to benzene in the area of the facility where their activities are performed.

**2.1.5** Provide the necessary information, when formally requested by the relevant supervisory bodies, related to the provisions in this Annex.

**2.1.6** Keep workers informed about the potential risks of exposure to benzene that could affect their safety and health, as well as the necessary preventive measures.

**2.1.7** Have Chemical Product Safety Data Sheets on fuel available to workers, in an easily accessible place for consultation..

**2.1.8** Educate workers about operational procedures that are meant to keep them informed on the risks of exposure to benzene and any necessary prevention measures.

**2.2** It is the workers responsibility to:

**2.2.1** Look after their health and safety or that of third parties who may be affected by exposure to benzene.

**2.2.2** Immediately notify their superior of situations that they consider a presence of imminent and serious danger to their or a third party's health and safety.

**2.2.3** Do not use flannel, oakum and similar fabrics for the containment of spills and extravasations, as established in item 9.7 of this annex.

**2.2.4** Use Personal Protective Equipment - PPE only for its intended purpose, and be responsible for its storage and maintenance, along with notifying the employer regarding any changes that make it unfit for use, as well as complying with the employer's determinations on its suitable usage.

### **3. Workers' Rights**

**3.1** In addition to what is established in the current law, the rights of workers are:

**3.1.1** To be notified of any potential risks of exposure to benzene that may affect their health and safety, as well as necessary preventative measures.

**3.1.2** If a worker, based on his training and experience, is convinced that there is an imminent and serious danger to his safety and health or to that of a third party, he shall halt the task and notify their superior immediately so that all corrective measures are taken. After assessing the situation and verifying the existence of imminent and serious danger conditions, the im-

mediate supervisor shall maintain the suspension of the task until the said situation is rectified.

#### **4. Internal Commission on Accident Prevention - CIPA**

**4.1** The provisions of NR-5 apply to the GS.

**4.1.1** The training content referred to in item 5.33 of NR-5, given to CIPA members or designated, in GSs operating with benzene-containing liquid fuels, should point to information on the risks of occupational exposure to benzene, as well as preventive measures in observance with the contents of item 5.1.1 in this annex.

#### **5. Workers' Training**

**5.1** Workers who conduct their activities with a risk of occupational exposure to benzene shall receive training with a minimum workload of 4 (four) hours. *(Check deadline on MTb Ordinance no. 1.109 of September 21<sup>st</sup>, 2016)*

**5.1.1** The content of the training referred to in item 5.1 shall encompass the following topics:

- a) risks of exposure to benzene and intake routes;
- b) basic concepts regarding environmental, biological and health monitoring;
- c) signs and symptoms of occupational intoxication from benzene;
- d) preventative measures;
- e) emergency procedures;
- f) basic characterization of facilities, risky activities and points of possible benzene emissions;
- g) legal provisions related to benzene .

**5.1.1.1** The training referred to in item 5.1 shall emphasize the identification of situations where there is a risk of exposure to benzene and the preventive measures in the major risk activities listed below:

- a) product check on the tanker truck in the act of unloading;
- b) collection of samples in the tanker truck with specific sampler;
- c) volumetric measurement of underground tank with a ruler;
- d) truck parking, grounding and connection via hoses to underground tanks;
- e) unloading of fuels for underground tanks;
- f) disconnection of the hoses and removal of residual contents;
- g) fuel supply for vehicles;

- h) supply of fuels in certified containers;
- i) physical-chemical analysis for quality control of products offered for sale;
- j) cleaning of valves, pumps and their containment compartments;
- k) depletion and cleaning of separator boxes;
- l) cleaning of passageways and gutters;
- m) calibration of supply pumps;
- n) operational maintenance of pumps;
- o) maintenance and refurbishment of the underground fuel supply system (SASC);
- p) other operations and activities that could be exposed to benzene.

**5.2** The training referred to in item 5.1 shall be renewed every 2 (two) years.

**5.3** The training referred to in item 5.1 may be carried out through distance education, provided there is provision in a collective labor agreement or convention.

## **6. Medical Occupational Health Control Program - PCMSO**

**6.1** The provisions of NR-7 apply to the GS, in addition to the following.

**6.2** Workers who perform their activities with a risk of occupational exposure to benzene should carry out a complete blood count with platelet and reticulocyte counts, at least every six months, independent of other tests provided for in the PCMSO.

**6.2.1** The cases of exemption from the application of the examinations established in item 6.2 shall be technically justified in the PPRA and PCMSO of the GS.

**6.3** The results of the hemograms shall be organized in an easy-to-understand historical series to facilitate the early detection of hematological abnormalities.

**6.4** The historical series of hemograms shall be maintained by the PCMSO Coordinating Physician.

**6.5** At the end of their services, the PCMSO Coordinating Physician who is responsible for keeping the historical series shall pass them on to the physician who will succeed him in the role.

**6.6** The results of the semi-annual hemograms and the updated historical

series shall be delivered to the workers, upon receipt, within a maximum of 30 days after the results are issued.

**6.7** At the end of the employment contract, the historical series of hemograms shall be delivered to the worker.

**6.8** The provisions of the Ministry of Health's Ordinance no. 776 of 28/04/2004, and any of its updates, apply to workers at GS, particularly regarding the criteria for interpreting the historical series of hemograms.

## **7. Environmental Assessment**

**7.1** The provisions of NR-9 apply to the GS, along with the following.

**7.2** The PPRA preliminary paper, referred to in item 9.2.2 of NR-9, shall contain the recognition of all activities, sectors, areas, operations, procedures and equipment where workers may be exposed to liquid benzene-containing fuels, either through inhalation or dermal, including the activities listed in sub-item 5.1.1.1 of this annex, where applicable.

**7.2.1** The information to be collected during the reconnaissance stage shall include normal operating procedures, maintenance procedures and emergency procedures.

## **8. Operational Procedures**

**8.1** The GS shall have operational procedures for the purpose of reporting the risks of exposure to benzene and the necessary prevention measures for the following activities:

*(Check deadline on MTb Ordinance no. 1.109 of September 21<sup>st</sup>, 2016)*

- a) supplying vehicles with liquid fuel containing benzene;
- b) cleaning and operational maintenance of:
  - manhole (sump tank);
  - containment tank for pumps (sump pump);
  - drainage gutters;
  - tanks and pipes;
  - oil-water separator box (SAO);
  - passage boxes for electrical and electronic systems;
  - calibration of pumps.
- c) an emergency in the event of any leakage of benzene-containing liquid fuels, reaching floors, workers clothing and workers bodies, particularly the eyes;
- d) measuring tanks with a ruler and calibrating benzene-containing



liquid fuel pumps;

- e) receiving benzene-containing liquid fuels, minimally encompassing:
  - identification and qualification of the professional responsible for the operation;
  - insulation of the area and grounding;
  - care during tank opening;
  - collective and individual protection equipment;
  - collection, analysis and storage of samples;
  - unloading.
- f) handling, conditioning and disposal of liquids and solid wastes contaminated with petroleum derivatives containing benzene.

**8.2** The GSs shall require contractors to provide technical maintenance services with the submittal of the operational procedures, which detail the risks of exposure to benzene and the necessary preventive measures, for the following activities:

- a) change of tanks and lines;
- b) preventive and corrective maintenance of equipment;
- c) capture and recovery of vapors system;
- d) tightness test;
- e) studies for a risk analysis of soil contamination;
- f) soil remediation.

**8.3** The procedures cited in items 8.1 and 8.2 shall be kept in writing at the workplace, available for inspection and for consultation by workers.

**8.4** The contents of the procedures mentioned in items 8.1 and 8.2 may be included in the document on the operational procedures required by item 20.7.1 of NR-20.

## **9. Operational Activities**

**9.1** The GSs that will begin their operation after the validity of this item shall have an electronic stock measurement system.

*(Check deadline on MTb Ordinance no. 1.109 of September 21<sup>st</sup>, 2016)*

**9.2** The GSs in operation and that already have storage tanks with the technical feasibility to install electronic measurement systems shall install the electronic system of stock measurement.

*(Check deadline on MTb Ordinance no. 1.109 of September 21<sup>st</sup>, 2016)*

**9.2.1** Storage tanks that have the technical feasibility for the installation of

electronic measuring systems are those that have manholes and that have already performed tasks for environmental suitability.

**9.2.2** The GSs not included in items 9.1 and 9.2 shall adopt the electronic stock measurement system when renovating with a change of storage tanks.

**9.3** Measuring tanks with a ruler is allowed in the following situations:

- a) for calibrating the electronic system;
- b) in situations in which the electronic measurement may not be carried out temporarily by the system;
- c) to verify the need for drainage of tanks;
- d) for the purposes of tightness test.

**9.3.1** In situations where the measurement of tanks must be conducted using a ruler, it is mandatory to use the PPE referred to in item 12 of this annex.

**9.4** All benzene-containing liquid fuel pumps shall be equipped with automatic nozzles.

*(Check deadline on MTb Ordinance no. 1.109 of September 21<sup>st</sup>, 2016)*

**9.5** The following activities involving liquid fuels containing benzene are prohibited:

- a) the transfer of benzene-containing liquid fuel from vehicle to self-propelled vehicle or from any containers for self-propelled vehicle using an oral suction hose;
- b) the transfer of benzene-containing liquid fuel between storage tanks by any means, except in emergency situations after the necessary preventive measures are adopted and with intrinsically safe and appropriate equipment for classified areas;
- c) the storage of benzene-containing liquid fuel samples in closed enclosures or areas where there is a regular presence of workers in any activities;
- d) the filling of vehicular tanks after the automatic system has been dismantled, referred to in item 9.4, except when an early release of the nozzle occurs, depending on the characteristics of the tank of the vehicle;
- e) the commercial use of benzene-containing liquid fuels in containers which are not certified for storage;
- f) any type of access by people to the interior of truck tanks or pipelines through which liquid fuels containing benzene are circulated;
- g) fuel supply with the use of nozzles that do not have an automatic disarming system.

**9.6** For containment of spills and leaks of benzene-containing liquid fuels during filling and other activities with this possibility, only materials which have been designed for this purpose may be used.

**9.7** It is the employer's responsibility to prohibit the use of flannel, oakum and similar fabrics for the containment of spills and leaks in the activities referred to in item 9.6.

**9.8** For the cleaning of surfaces contaminated with benzene-containing liquid fuels, only absorbent paper towels shall be allowed for use, provided the worker is wearing appropriate impermeable gloves.

**9.8.1** The material referred to in item 9.8 may only be used once and shall then be packaged for later disposal in an appropriate container for this purpose, which shall be available near the area of operation.

**9.9** Physical and chemical analyzes of benzene-containing liquid fuels should be performed in a ventilated place and away from other work areas, eating areas and dressing rooms.

**9.9.1** Analyzes performed in closed areas shall be done under a localized exhaust system or in an exhaust hood.

## **10. Annex Workplaces**

**10.1** GSs should have a dedicated area for the storage of samples collected from liquid benzene-containing fuels, provided with adequate ventilation and temperature, and away from other work areas, eating areas and dressing rooms.

**10.2** GSs should adopt measures to ensure air quality in their internal environments annex to the filling, unloading, and venting areas of benzene-containing liquid fuel tanks such as offices, convenience stores, and others. *(Check deadline on MTb Ordinance No. 1.109 of September 21<sup>st</sup>, 2016)*

**10.2.1** Air conditioning systems which collect air from the external environment or another of equal efficiency shall be installed in such a way as to avoid any contamination of the internal environments from liquid fuel vapors containing benzene from those areas.

## **11. Uniform**

**11.1** The provisions of NR-24 apply to the GS, particularly regarding the separation between the uniform and commonly worn clothing.

**11.2** GS workers with activities involving occupational exposure to benzene shall be provided, free of charge and by the employer, a uniform and work shoes appropriate for those risks.

**11.3** Cleaning of uniforms shall be done by the employer with a minimum frequency of once a week.

**11.4** The employer shall keep an extra set of uniforms available in the GS for at least 1/3 (one third) of the workforce exposed to liquid benzene-containing fuels, readily available in situations where the uniform may become contaminated by such products.

## **12. Personal Protective Equipment (PPE)**

**12.1** The provisions of NR-6 of Normative Instruction No. 1 of April 11, 1994 apply to the GS, in addition the following.

**12.1.1** Workers who carry out, directly or indirectly, the critical activities listed in sub-item 5.1.1.1, except items "d", "g" and "h", and even in the case of sealed discharge activity, item "e" , shall wear full-face respiratory protection, with an organic vapor filter, as well as skin protection equipment. *(Amended by MTb Ordinance no. 871 of July 6<sup>th</sup>, 2017)*

**12.1.1.1** When the exhaust system provided for in item 9.9.1 is under maintenance, respiratory protective equipment shall be provisionally used, taking into account the specification of item 12.1.1.

**12.1.1.2** The employer may choose other respiratory protective equipment that is more appropriate to the characteristics of the working process at the GS than that suggested in item 12.1.1, provided that the change represents a greater protection for the worker.

**12.1.1.3** Periodic replacement of mask filters is mandatory and shall comply with the manufacturer's instructions and with IN no. 01/94 of the MTE.

**12.2** The workers who perform the activity of filling vehicles, referred to in items "g" and "h" of item 5.1.1.1, according to the inherent characteristics of the activity itself, are exempt from the use of respiratory protection equipment.

## **13. Signage referring to Benzene**

**13.1** The GSs shall maintain visible signage in front of the benzene-

containing liquid fuel supply pumps, indicating the risks of that substance on a sign measuring 20 x 14 cm with the words: "GASOLINE CONTAINS BENZENE, A CANCERIGENT SUBSTANCE. HAZARDOUS TO HEALTH."

**14.** Collective Control of Exposure during filling

**14.1** The GSs shall install a vapor recovery system.

*(Check deadline on MTb Ordinance No. 1.109 of September 21<sup>st</sup>, 2016)*

**14.2** For the purposes of this Annex, a vapor recovery system shall be considered to be a vapor trap in the fuel pump nozzles containing benzene which directs the vapors to the GS's own fuel tank or to vapor treatment equipment.

**14.3** The new GSs, approved and built after three years of the publication of this annex, shall have installed the system provided in item 14.1.

*(Check deadline on MTb Ordinance No. 1.109 of September 21<sup>st</sup>, 2016)*