20.1 Introduction

20.1.1 This Regulatory Norm (NR) establishes minimum requirements for managing occupational safety and health against risk factors of accidents resulting from the activities that involve the extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids.

20.2 Scope

20.2.1 This NR applies to the activities of:

a) extraction, production, storage, transfer, handling and manipulation of flammable materials in the stages involving the design, construction,
assembly, operation, maintenance, inspection and deactivation of the facility;
b) extraction, production, storage, transfer and handling of combustible liquids in
the stages involving the design, construction, assembly, operation, maintenance, inspection and deactivation of the facility.

20.2.2 This NR does not apply:
a) to platforms and support facilities used for oil and gas exploration and
production from the seabed, as defined in Annex II of Regulatory Norm 30 (SIT
Ordinance no. 183 of May 11th, 2010);
b) to single-family residential buildings.

20.3 Definitions

20.3.1 Flammable liquids: liquids that have a flash point of ≤ 60°C.
20.3.2 Flammable gases: gases that ignite with air at 20°C and a standard
pressure of 101.3 kPa.
20.3.3 Combustible liquids: liquids with flash point > 60°C and ≤ 93°C.

20.4 Classification of Facilities

20.4.1 For the purpose of this NR, facilities are divided into classes, in
accordance with Table 1.

<table>
<thead>
<tr>
<th>Class 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) With respect to activity:</td>
</tr>
<tr>
<td>a. 1-service stations with flammable materials and/or combustible liquids.</td>
</tr>
<tr>
<td>b) With respect to storage capacity, on a permanent and/or transitory basis:</td>
</tr>
<tr>
<td>b.1 - flammable gases: above 2 tons up to 60 tons;</td>
</tr>
<tr>
<td>b.2 - flammable and/or combustible liquids: above 10 m³ up to 5,000 m³.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Class II</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) With respect to activity:</td>
</tr>
<tr>
<td>a.1 - flammable gases bottlers;</td>
</tr>
<tr>
<td>a.2 - activities involving pipeline transportation of flammable and/or combustible gases and liquids.</td>
</tr>
<tr>
<td>b) With respect to storage capacity, on a permanent and/or transitory basis:</td>
</tr>
<tr>
<td>b.1 - flammable gases: above 60 tons up to 600 tons;</td>
</tr>
<tr>
<td>b.2 - flammable and/or combustible liquids: above 5,000 m³ up to 50,000 m³.</td>
</tr>
</tbody>
</table>

| Class III                                   |
With respect to activity:

a.1 - refineries;
a.2 - natural gas processing units;
a.3 - petrochemical facilities;
a.4 - ethanol manufacturing plants and/or alcohol manufacturing facilities.

With respect to storage capacity, on a permanent and/or transitory basis:
b.1 - flammable gases: above 600 tons;
b.2 - flammable and/or combustible liquids: above 50,000 m³.

20.4.1.1 For the classification criteria, the stated activity type has priority over storage capacity.

20.4.1.2 When the storage capacity of facilities falls into two distinct classes, due to the storage of flammable and/or combustible liquids and flammable gases, the highest grading class shall be adopted.

20.4.2 This NR establishes two types of facilities that are exceptions, defined in Annex I, to which Table 1 shall not be applied.

20.5 Facility Design

20.5.1 Facilities for extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids shall be designed considering safety, health and environmental aspects that affect the physical integrity of workers in accordance with Regulatory Norms, national technical standards, and, in the absence or omission thereof, in international standards, conventions and collective agreements, as well as other relevant effective regulations.

20.5.2 The design of classes II and III facilities must minimally contain, in Portuguese:

a) a description of the facilities and their respective processes through an operation manual;
b) a general layout of the facilities’ location;
c) safety, health and environmental characteristics and information related to flammable materials and combustible liquids, to be contained in the safety data sheets of chemicals, raw materials, consumables and finished products;
d) process flowchart;
e) technical specification of critical equipment, machinery and accessories in terms of occupational safety and health established by a risk assessment;
f) plans, drawings and technical specifications of the facility’s safety systems;
g) identification of classified areas of the facility in order to specify electrical
equipment and installations;
h) intrinsic safety measures identified in the risk analysis of the design.

20.5.2.1 The design of class I facilities shall include topics “a”, “b”, “c”, “f” and “g” of item 20.5.2.

20.5.2.2 The safe distances between facilities, buildings, tanks, machinery, equipment, movement and flow areas, internal circulation routes, as well as the limits of the property in relation to surrounding areas and public roads, established in national technical standards, shall be observed in the design.

20.5.2.3 The design shall include the definition of control mechanisms to stop and/or reduce a possible chain of events resulting from leaks, fires or explosions.

20.5.3 Designs for existing facilities shall be upgraded through the use of risk analysis methods in order to identify the necessity of adopting complementary protection measures.

20.5.4 Every pressurized system shall have safety devices defined in national technical standards and, in the absence or omission thereof, in international standards.

20.5.5 Modifications or expansions of facilities that may affect the safety and physical integrity of workers shall be preceded by a design that includes a risk analysis study.

20.5.6 The design shall be prepared by a licensed professional.

20.5.7 For process of transferring, filling containers or tanks, preventive measures shall be defined in the design to:
a) eliminate or minimize the emission of flammable vapors and gases;
b) control the generation, accumulation and discharge of static electricity.

20.6 Safety in Construction and Assembly

20.6.1 The construction and assembly of facilities for the extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids shall meet the specifications in the design, as well as in the Regulatory Norms and national technical standards and, in the absence or omission thereof, in international standards.

20.6.2 The inspections and tests performed on the construction and assembly phase and in commissioning shall be documented in accordance with the provisions in the Regulatory Norms, in the national technical standards and, in the absence or omission thereof, in international standards, and in the manufacturer's manuals of the machinery and equipment.
20.6.3 The equipment and facilities shall be identified and marked in accordance with the provisions set out by Regulatory Norms and national technical standards.

20.7 Operational Safety

20.7.1 The employer shall prepare, document, implement, promote and maintain updated operating procedures covering aspects of occupational safety and health in accordance with the design specifications of facilities classes I, II and III and with the recommendations from the risk analyses.

20.7.1.1. For classes II and III industrial facilities with process units, the procedures referred to in item 20.7.1 shall have clear instructions for the development of activities in each of the following stages:

a) pre-operation;
b) normal operation;
c) temporary operation;
d) emergency operation;
e) normal stop;
f) emergency stop;
g) post-emergency operation.

20.7.2 The operating procedures referred to in item 20.7.1 shall be reviewed and/or updated at most every three years for classes I and II facilities and every five years for class III facilities or in one of the following situations:

a) recommendations arising from a shift management system;
b) recommendations arising from risk analyses;
c) modifications or expansions of the facility;
d) recommendations arising from accidents analyses and/or incidents at work related to flammable materials and combustible liquids;
e) CIPA or SESMT requests.

20.7.3 For operations of transfer of flammable materials, filling of containers or tanks, procedures shall be adopted to:

a) eliminate or minimize the emission of flammable vapors and gases;
b) control the generation, accumulation and discharge of static electricity.

20.7.4 For processes involving the transfer of flammable materials and combustible liquids, operational control measures and/or engineering measures of fugitive emissions, arising during the loading and unloading of fixed tanks and transport vehicles, shall be implemented in order to eliminate or minimize these emissions.
20.7.5 For operations involving flammable materials and combustible liquids in continuous production process facilities and in class III facilities, the employer shall scale a sufficient number of workers to carry out the operational tasks safely.

20.7.5.1 The criteria and parameters used for scaling the number of workers shall be documented.

20.8 Maintenance and Inspection of Facilities

20.8.1 Classes I, II and III facilities for extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids shall have a duly documented inspection and maintenance plan.

20.8.2 The inspection and maintenance plan shall include, at the minimum:

a) equipment, machines, pipes and accessories, instruments;
b) types of intervention;
c) inspection and maintenance procedures;
d) annual schedule;
e) identification of responsible staff;
f) specialty and training of personnel for inspection and maintenance;
g) specific health and safety procedures;
h) systems and collective and personal protection equipment.

20.8.3 The plans shall be periodically reviewed and updated, considering the provisions of the Regulatory Norms, of national technical standards and, in the absence or omission thereof, of international standards, of inspection manuals, as well as of manuals provided by the manufacturers.

20.8.3.1 All manuals shall be available in Portuguese.

20.8.4 The frequency of inspections and maintenance interventions shall consider:

a) provisions of Regulatory Norms and national technical standards and, in the absence or omission thereof, of international standards;
b) the manufacturer's recommendations, especially the items that are critical to the health and safety of the worker;
c) the recommendations from reports of safety inspections and of occupational accidents and incidents analysis, prepared by the CIPA or SESMT;
d) recommendations arising from risk analyses;
e) the existence of hazard environmental conditions.

20.8.5 The inspection and maintenance plan and their respective activities shall be documented in a proper form or computerized system.
20.8.6 Inspection and maintenance activities shall be carried out by trained workers and under appropriate supervision.

20.8.7 The recommendations resulting from inspections and maintenance shall be registered and implemented, establishing deadlines and responsible staff for the execution.

20.8.7.1 Any recommendation not implemented within the determined deadline shall be justified and documented.

20.8.8 A work permit shall be prepared for non-routine intervention activities on equipment, based on a risk analysis, for work:
   a) that can generate flames, heat, sparks or involving their use;
   b) in confined spaces, according to Regulatory Norm no. 33;
   c) involving the isolation of equipment and blocking/tagging;
   d) in high areas with a risk of falls;
   e) with electrical equipment, according to Regulatory Norm no. 10;
   f) at which good safety and health practices are recommended.

20.8.8.1 Routine inspection and maintenance activities shall be preceded by work instruction.

20.8.9 The planning and execution of shutdowns for scheduled maintenance at a facility shall incorporate aspects related to occupational safety and health.

20.9 Safety and Health Inspection in the Workplace

20.9.1 Classes I, II and III facilities for extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids shall have periodic inspections focused on safety and health at the work environment.

20.9.2 In conjunction with CIPA, a schedule of inspections on safety and health of the work environment shall be prepared in accordance with the risks of the developed activities and operations.

20.9.3 The inspections shall be documented and their recommendations implemented, establishing deadlines and the responsible staff for their implementation.
20.9.3.1 Any recommendation not implemented within the determined deadline shall be justified and documented.

20.9.4 The inspection reports shall be available to the relevant authorities and to workers.

20.10 Risk Analysis

20.10.1 For classes I, II, and III facilities, the employer shall establish and document risk analyses of operations involving process or processing activities of extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids.

20.10.2 The risk analyses of facilities shall be structured according to appropriate methodologies, chosen for the purposes of the analysis, the characteristics and the complexity of the facility.

20.10.2.1 The risk analyses shall be coordinated by a licensed professional.

20.10.2.2 The risk analyses shall be prepared by a multidisciplinary team with expertise in the application of the methodologies, the risks and the facility, with the participation of at least one worker with experience at the facility, or part thereof, that is undergoing the analysis.

20.10.3 For class I facilities, a Preliminary Analysis of Hazards/Risks (APP/APR) shall be prepared.

20.10.4 For classes II and III facilities, analysis methodologies defined by a licensed professional shall be used, and shall be chosen taking into account the facility's risks, characteristics and complexity.

20.10.4.1 The licensed professional shall technically justify the methodology choice and record it in the analysis itself.

20.10.5 The risk analyses shall be revised:
   a) at a frequency established for the renewals of the license for the facility operation;
   b) within a deadline recommended by the analysis itself;
   c) if significant changes occur in the process or processing;
   d) by a request from SESMT or CIPA;
   e) by recommendation arising from accidents or incidents analysis related to the process or processing;
   f) when the accident and incident records require it.

20.10.6 The employer shall implement the recommendations arising from the risk analyses, establishing deadlines and responsible staff for executing the tasks.
20.10.6.1 Any recommendation not implemented within the defined deadline shall be justified and documented.

20.10.7 The risk analyses shall be linked to the facility’s Environmental Risk Prevention Program (PPRA).

20.11 Worker Training

20.11.1 All training provided for in this NR shall be carried out at the expense and cost of the employer and during normal business hours.

20.11.1.1 The criteria set out in items 20.11.2 up to 20.11.9 are summarized in Annex II.

20.11.2 Workers who operate in classes I, II or III facilities and do not enter the area or location of extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids shall be provided with information on the hazards, risks and procedures for emergency situations.

20.11.3 Workers who operate in classes I, II or III facilities and enter the area or location of extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids, but do not maintain direct contact with the process or processing, shall take an Integration course.

20.11.4 Workers who operate in classes I, II or III facilities and enter the area or location of extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids and maintain direct contact with the process or processing, performing specific, occasional or short-term activities, shall take a Basic course.

20.11.5 Workers who operate in classes I, II or III facilities and enter the area or location of extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids and maintain direct contact with the process or processing, performing inspection and maintenance activities, shall take an Intermediate course.

20.11.6 Workers who operate in class I facilities and enter the area or location of extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids and maintain direct contact with the process or processing, performing activities involving operation and emergency services, shall take an Intermediate course.

20.11.7 Workers who operate in class II facilities and enter the area or location of extraction, production, storage, transfer, handling and manipulation of flammable materials and/ combustible liquids and maintain direct contact with the process or processing, performing activities involving operation and emergency services, shall take an Advanced I course.

20.11.8 Workers who operate in class III facilities and enter the area or
location of extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids and maintain direct contact with the process or processing, performing activities involving operation and emergency services, shall take an Advanced II course.

20.11.9 Occupational health and safety professionals who operate in classes II and III facilities, enter the area or location of extraction, production, storage, transfer, handling and manipulation of flammable materials and combustible liquids, and maintain direct contact with the process or processing shall take a Specific course.

20.11.10 Workers who took the Basic course and might need the Intermediate course shall complete a complementary 8-hour course load in the contents established by items 6, 7 and 8 of the Intermediate course, including the practical part.

20.11.11 Workers who took the Intermediate course and might need the Advanced I course shall complete a complementary 8-hour course load in the contents established by items 9 and 10 of the Advanced I course, including the practical part.

20.11.12 Workers who took the Advanced I course and might need the Advanced II course shall complete a complementary 8-hour course load in the contents established by items 11 and 12 of the Advanced II course, including the practical part.

20.11.13 Workers shall participate in an Update course, whose contents shall be determined by the employer and with the following frequency:
   a) Basic course: every 3 years with a course load of 4 hours;
   b) Intermediate course: every 2 years with a course load of 4 hours;
   c) Advanced I and II course: every year with a course load of 4 hours.

20.11.13.1 An Update course shall be taken immediately for workers involved in the process or processing, where:
   a) a significant modification occurs;
   b) a worker’s death occurs;
   c) injuries occur as a result of explosion and/or 2\textsuperscript{nd} or 3\textsuperscript{rd} degree burns, which required hospitalization;
   d) the accident and/or incident records require it.

20.11.14 Instructors for Integration, Basic, Intermediate, Advanced I and II and Specific training courses shall have proficiency in the subject.

20.11.15 The Integration, Basic and Intermediate courses shall have a person in charge of their technical organization, who shall be one of the instructors.

20.11.16 The advanced I and II and Specific courses shall have a licensed
professional as the technical manager.

20.11.17 For Integration, Basic, Intermediate, Advanced I and II and Specific courses, certification shall be issued to workers who, after an evaluation, have reached a satisfactory performance.

20.11.17.1 The certification shall contain the worker’s name, course contents, course load, date, location, instructor(s)’ name, name and signature of the technical manager or the person in charge of the technical organization of the course.

20.11.17.2 The certification shall be provided to the worker upon receipt, and a copy shall be filed at the company.

20.11.18 Participants in training shall receive educational material, which may be in printed, electronic or similar forms.

20.11.19 The employer shall establish and maintain an identification system which allows to recognize each worker’s qualifications, and it is mandatory that each worker use in a visibly manner the identifier.

20.12 Prevention and Control of Leaks, Spills, Fires, Explosions and Fugitive Emissions

20.12.1 The employer shall prepare a plan for the prevention and control of leaks, spills, explosions and fires involving flammable materials and combustible liquids, and, at locations where workers operate, an indication of sources of fugitive emissions.

20.12.2 The plan shall include all demanded resources and actions to minimize the risk of leakage, spill, fire and explosion, as well as to reduce its consequences in the event of failure in any prevention and control systems.

20.12.2.1 For fugitive emissions, after their sources have been identified at locations where workers operate, the plan shall include actions for minimizing risks, in accordance with technical viability.

20.12.3 The plan shall be revised:
  a) according to recommendations arising from safety inspections and/or a risk analysis;
  b) when significant modifications occur at the facilities;
  c) upon the occurrence of leaks, spills, fires and/or explosions.

20.12.4 The prevention and control systems shall be appropriate for the hazards/risks of flammable materials and combustible liquids.

20.12.5 Tanks storing flammable and combustible liquids shall have leakage or spill containment systems, scaled and constructed in accordance with national
technical standards.

20.12.5.1 In the case of containment basins, the storage of materials, containers and similar contents inside it is prohibited, except during maintenance and inspection activities.

20.13 Control of Ignition Sources

20.13.1 All electrical installations and fixed, mobile and portable electrical equipment, communication
equipment, tools and similar devices used in classified areas, as well as
equipment for controlling atmospheric discharges, shall comply with Regulatory
Norm no. 10.

20.13.2 The employer shall implement specific measures for controlling the
generation, accumulation and discharge of static electricity in areas subject to the
existence of flammable atmospheres.

20.13.3 Work involving the use of equipment that may generate heat, flames or
sparks, in areas that are subject to the existence of flammable atmospheres,
shall be preceded by a work permit.

20.13.4 The employer shall place signs prohibiting the use of ignition sources in
areas that are subject to the existence of flammable atmospheres.

20.13.5 Vehicles circulating in areas that are subject to the existence of
flammable atmospheres shall be suitable for the location and be kept in perfect
maintenance condition.

20.14 Emergency Response Plan for the Facility

20.14.1 The employer shall prepare and implement an emergency response
plan that includes specific actions to be taken in the event of leaks or spills of
flammable materials and combustible liquids, fires or explosions.

20.14.2 The emergency response plan for classes I, II and III facilities shall be
prepared considering the characteristics and complexities of the facility and
contain at least the following:

a) name and duties of the technician(s) in charge of preparing and reviewing the
plan;

b) name and duties of the person responsible for the management, coordination
and implementation of the plan;

c) designation of emergency team members who are responsible for executing
each action, and their respective substitutes;

d) definition of possible emergency scenarios, based on risk analysis;

e) description of the necessary resources for each defined scenario;

f) description of the communication forms;

g) emergency response procedures for each defined scenario;

h) procedures for communication with public authorities and triggering of mutual
assistance, if any exist;

i) guidance procedures for visitors on existing risks and how to proceed in
emergency situations;

j) schedule, methodology and records of conducting simulated exercises.

20.14.3 In cases where the risk analyses results indicate the possibility of an
accident whose consequences exceed the boundaries of the facility, the employer shall incorporate in the emergency plan actions aiming the protection of the surrounding community, establishing mechanisms for communication and alert, for isolation of the affected area and for triggering public authorities.

20.14.4 The emergency response plan shall be evaluated after the conduction of simulated exercises and/or in the event of real situations in order to test its effectiveness, detect potential failures and adopt the necessary adjustments.

20.14.5 The simulated exercises shall be carried out during working hours, on an annual basis (at minimum), and may be reduced depending on the detected failures or if the risk analysis recommends it.

20.14.5.1 Workers at the company shall be involved in the simulated exercises, which shall reflect, as faithfully as possible, the job routine.

20.14.5.2 The employer shall establish certain criteria for evaluating the results of the simulated exercises.

20.14.6 The members of the emergency response team shall be subjected to medical tests that are specific to the duties they perform, according to Regulatory Norm no. 7, including psychosocial risks factors, with the issuance of the respective Occupational Health Certificate.

20.14.7 Worker participation in emergency response teams is voluntary, except where the nature of the duty so determines it.

20.15 Incident Reporting

20.15.1 The employer shall communicate the regional agency of the Ministry of Labor and Employment and the labor union from the prevailing professional category at the establishment any occurrence of a leak, fire or explosion involving flammable materials and combustible liquids resulting in any of the following:
   a) death of employee(s);
   b) injuries occurring as a result of explosion and/or 2nd or 3rd degree burns, which required hospitalization;
   c) trigging the emergency response plan, which demanded intervention and control measures to be adopted.

20.15.1.1 The communication shall be forwarded by the second business day after the occurrence and shall contain:
   a) name of the company, address, location, date and time of the occurrence;
   b) description of the occurrence, including information on flammable materials, combustible liquids and other products involved;
   c) name and duties of the victim;
   d) adopted investigation procedures;
   e) consequences;
   f) adopted emergency measures.

20.15.1.2 The communication may be made through an official notice or by
electronic means to the labor union from the prevailing professional category at the establishment and to the occupational safety and health sector of the regional agency of the Ministry of Labor and Employment.

20.15.2 The employer shall prepare an investigation and analysis report of the occurrence described in item 20.15.1, containing the root causes and the adopted preventive measures, and maintain it at the workplace available for the competent authority, the workers and their representatives.

20.16 Contracting Party and Hired Party

20.16.1 The contracting and the hired parties are jointly and severally liable for compliance with this Regulatory Norm.

20.16.2 Responsibilities of the contracting party.

20.16.2.1 The occupational safety and health requirements adopted for the hired party’s employees shall be at least equivalent to those applied for the contracting party’s employees.

20.16.2.2 The contracting company, in order to comply with the provisions of this NR, shall verify and evaluate the performance in occupational safety and health of the contracted services.

20.16.2.3 The contracting party shall notify the hired parties and their employees about the existing hazards at the workplace and the respective security measures and emergency response to be adopted.

20.16.3 Responsibilities of the hired parties.

20.16.3.1 The hired company shall comply with the occupational safety and health requirements specified by the contractor, by this and other Regulatory Norms.

20.16.3.2 The hired company shall ensure its employees participation in courses on occupational safety and health promoted by the contractor, as well as providing other specific training that are required.

20.17 Flammable liquid tanks within buildings

20.17.1 Tanks for storing flammable liquids shall only be installed inside buildings if the tanks are buried and only be used for diesel oil.

20.17.2 Exceptions to the item 20.17.1 are surface tanks storing diesel oil intended for the supply of motors used for generating electric power in emergency situations or for the operation of water pressurization pumps for firefighting, in cases where there is proof that it is impossible to install them buried or outside the horizontal projection of the building.

20.17.2.1 The installation of a tank inside a building shall be preceded by a
Design and by a Preliminary Analysis of Hazards/Risks (APP/APR), both prepared by a licensed professional, containing aspects of safety, health and environment provided for in the Regulatory Norms, national technical standards and, in the absence or omission thereof, in international standards, as well as in other relevant regulations, and shall comply with the following criteria:

a) to be located on the ground floor, basement or on stilts, in an area exclusively intended for this purpose;

b) shall contain a leakage containment system;

c) shall contain up to 3 tanks separated from each other and from the rest of the building by fire-resistant walls (resistant for at least two hours) and a fire proof door;

d) shall have total volume of 3,000 liters maximum storage in each tank;

e) shall have approval by the competent authority;

f) the tanks shall be made of metal;

g) shall have automatic detection and firefighting systems, as well as emergency exits scaled according to technical standards;

h) the tanks shall be located so as not to block, in case of emergency, access to emergency exits and fire safety systems;

i) the tanks shall be protected against vibration, physical damage and the proximity of heat-generating equipment or ducts;

j) the building's structure shall be protected to withstand a possible fire originating in the premises storing the tanks;

k) required measures shall be adopted to ensure that tanks are vented in order to relief pressure, as well as the safe operation of supplying and disposing the gases produced by the combustion engines.

20.17.2.2 The building safety officer shall appoint a technical manager responsible for the installation, operation, inspection and maintenance, as well as for supervising the safety procedures in the tank supply process.

20.17.2.3 Workers involved in the operation, inspection, maintenance and supply of the tank shall be trained with the Intermediate course, as established in Annex II.

20.17.3 The provisions in item 20.17.2.1 and its lines "b", "e", "f", "g", "h", "i", "j" and "k", item 20.17.2.2 and 20.17.2.3 apply to buried tanks, as well as those provided for in national technical standards and, in the absence or omission thereof, in international technical standards.

20.18 Deactivation of a Facility

20.18.1 Once the facility's activities have ceased, the employer shall adopt the necessary procedures to deactivate it.

20.18.2 The deactivation process of facilities designed for extraction,
production, storage, transfer, handling and manipulation of flammable materials and combustible liquids shall consider safety, health and environmental aspects provided for in the Regulatory Norms, national technical standards, and, in the absence or omission thereof, in international standards, as well as other relevant effective regulations.

20.19 Facility Fact Sheet

20.19.1 The Facility Fact Sheet shall be organized, maintained and updated by the employer and include the following documentation:

a) Facility Design;

b) Operating procedures;

c) Inspection and Maintenance Procedures;

d) Risk Analysis;

e) Plan for the prevention and control of leaks, spills, fires and explosions and identification of sources fugitive emissions;

f) Workers training certifications;

g) Accident Analysis;

h) Emergency Response Plan.

20.19.2 The class I Facility Fact Sheet shall contain an index and constitute a single document.

20.19.2.1 Documentation for the classes II or III Facility Fact Sheets may be separated, provided that the index mentions its location at the company and the respective person in charge.

20.19.3 The Facility Fact Sheet shall be available to the relevant authorities, as well as available for consultation by workers and their representatives.

20.19.3.1 The risk analyses shall be available for consultation by workers and their representatives, except in the aspects or parts that involve confidential commercial information.

20.20 Final Provisions

20.20.1 When an extraction, production, storage, handling and manipulation activity of flammable materials and combustible liquids is characterized as a serious and imminent risk for workers, the employer shall take the necessary measures to interrupt and correct the situation.

20.20.2 Based on their training and experience, workers shall discontinue their duties (through their right of refusal) whenever they find evidence of serious and imminent risks to their safety and health or to other people, and shall immediately notify their superior who shall then adopt appropriate action.
20.20.3 Tanks, vessels and pipelines storing/transporting flammable materials and combustible liquids shall be identified and labeled in accordance with Regulatory Norm no. 26.

20.20.4 In welding and hot-cutting operations that use flammable gases, the hoses shall have mechanisms that prevent any backlash of the flames at the exit of the cylinder and at the area of the torch.

ANNEX I of NR-20
Facilities that constitute exceptions to the item 20.4 (Classification of Facilities)

1. Facilities that conduct handling, storage, manipulation and transport activities with flammable gases above 1 ton up to 2 tons and with flammable and/or combustible liquids above 1 m³ up to 10 m³ shall consider in the Environmental Risk Prevention Program, in addition to the requirements of Regulatory Norm no. 9:
   a) the inventory and characteristics of flammable materials and/or combustible liquids;
   b) the specific risks relating to locations and activities with flammable materials and/or combustible liquids;
   c) accident prevention procedures and plans with flammable materials and/or combustible liquids;
   d) measures for action at emergency situation.

1.1 The employer shall train at least three workers at the facility who are directly involved with flammable materials and/or combustible liquids in the Basic course established in Annex II.

2. Retail and wholesale facilities that undertake activities involving the handling, storage and transport of up to 20-liter containers, closed or sealed, containing flammable and/or combustible liquids up to the maximum limit of 5,000 m³ and flammable gases up to the maximum limit of 600 tons, shall implement in the Environmental Risk Prevention Program, in addition to the requirements of Regulatory Norm no. 9:
   a) the inventory and characteristics of flammable materials and/or combustible liquids;
   b) the specific risks relating to locations and activities with flammable materials and/or combustible liquids;
   c) accident prevention procedures and plans regarding flammable materials and/or combustible liquids;
   d) measures for action at emergency situation.

2.1 The employer shall train workers at the facility who are directly involved with flammables materials in the Basic course according to the proportion defined in Table 2.
Table 2

<table>
<thead>
<tr>
<th>Capacity stored (flammable gases and/or flammable and/or combustible liquids)</th>
<th>No. of trained workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 1 ton up to 5 tons and/or above</td>
<td>At minimum 2</td>
</tr>
<tr>
<td>Above 5 tons up to 10 tons and/or above</td>
<td>At minimum 3</td>
</tr>
<tr>
<td>Above 10 tons up to 20 tons and/or</td>
<td>At minimum 4</td>
</tr>
<tr>
<td>For every 20 tons and/or 84 m³</td>
<td>2 more workers</td>
</tr>
</tbody>
</table>

2.2 For the purposes of items 2 and 2.1 of this Annex, a prevention and firefighting course that has already been taken by the worker up to two years from the date of publication of this NR may be accepted, provided that it has a minimum course load of 6 hours and includes at least 80% of the basic course content provided for in Annex II.

3. The provisions of items 2 and 2.1 of this Annex shall apply for the storage facility that have closed or sealed containers up to 20 liters containing flammable and/or combustible liquids up to a maximum limit of 10,000 m³ and flammable gases up to the maximum limit of 1,200 tons, provided that the storage facility is separated by a wall from the facility where the manufacture, labeling and packaging of the product to be stored takes place.


ANNEX II of NR-20
Criteria for Worker Training Course Contents

1) Criteria for Training
a) Training for workers who enter the area and DO NOT maintain direct contact with the process or processing.

<table>
<thead>
<tr>
<th>Class I facility</th>
<th>Class II facility</th>
<th>Class III facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration Course (4 hours)</td>
<td>Integration Course (4 hours)</td>
<td>Integration Course (4 hours)</td>
</tr>
</tbody>
</table>

b) Training for workers who enter the area and DO maintain direct contact with the process or processing.

<table>
<thead>
<tr>
<th>Class Activity</th>
<th>Class I facility</th>
<th>Class II facility</th>
<th>Class III facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific, occasional or short-term</td>
<td>Basic Course (8 hours)</td>
<td>Basic Course (8 hours)</td>
<td>Basic Course (8 hours)</td>
</tr>
<tr>
<td>Inspection and</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Course (16 hours)</td>
<td>Course (16 hours)</td>
<td>Course (16 hours)</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Operation and emergency service</td>
<td>Intermediate Course (16 hours)</td>
<td>Advanced I Course (24 hours)</td>
<td>Advanced I Course (32 hours)</td>
</tr>
<tr>
<td>Occupational Safety and Health</td>
<td>-</td>
<td>Especific Course (16 hours)</td>
<td>Especific Course (16 hours)</td>
</tr>
</tbody>
</table>

2) Course Contents

a) Integration Course
Course load: 4 hours
1. Flammable materials: characteristics, properties, hazards and risks;
2. Collective and individual controls for work with flammable substances;
3. Ignition sources and their control;
4. Basic procedures in emergencies with flammable materials.

b) Basic Course
Course load: 8 hours
I) Theoretical course content:
1. Flammable materials: characteristics, properties, hazards and risks;
2. Collective and individual controls for work with flammable substances;
3. Ignition sources and their control;
4. Fire protection with flammable materials;
5. Basic procedures in emergencies with flammable materials.
II) Practical course content:
Knowledge and use of the fire safety systems with flammable materials.

c) Intermediate Course
Course load: 16 hours
I) Theoretical course content:
1. Flammable materials: characteristics, properties, hazards and risks;
2. Collective and individual controls for work with flammable substances;
3. Ignition sources and their control;
4. Fire protection with flammable materials;
5. Basic procedures in emergencies with flammable materials;
6. Study of Regulatory Norm no. 20;
7. Preliminary analysis of hazards/risks: concepts and practical exercises;
8. Work Permit with Flammable materials.

II) Practical course content:
Knowledge and use of the fire safety systems with flammable materials.

d) Advanced I Course
Course load: 24 hours
I) Theoretical course content:
1. Flammable materials: characteristics, properties, hazards and risks;
2. Collective and individual controls for work with flammable substances;
3. Ignition sources and their control;
4. Fire protection with flammable materials;
5. Basic procedures in emergencies with flammables materials;
6. Study of Regulatory Norm no. 20;
7. Risk analysis methodologies: concepts and practical exercises;
8. Work Permit with flammable materials;
9. Accidents involving flammable materials: analysis of causes and preventive measures;

II) Practical course content:
Knowledge and use of the fire safety systems with flammable materials.

e) Advanced II Course
Course load: 32 hours
I) Theoretical course content:
1. Flammable materials: characteristics, properties, hazards and risks;
2. Collective and individual controls for work with flammable substances;
3. Ignition sources and their control;
4. Fire protection with flammable materials;
5. Basic procedures in emergencies with flammable materials;
6. Study of Regulatory Norm no. 20;
7. Risk analysis methodologies: concepts and practical exercises;
8. Work Permit with flammable materials;
9. Accidents involving flammable materials: analysis of causes and preventive measures;
10. Emergency response plan with flammable materials;
11. Understanding the safety processes at the installation;
12. Understanding management of changes.

II) Practical course content:
Knowledge and use of the fire safety systems with flammable materials.

f) Specific Course
Course load: 16 hours
I) Practical course content:
- Study of Regulatory Norm no. 20;
- Risk analysis methodologies: concepts and practical exercises;
- Work Permit with flammable materials;
- Accidents involving flammable materials: analysis of causes and preventive measures;
- Emergency response plan with flammable materials.

GLOSSARY
Classified Areas - an area in which an explosive atmosphere is present or in which it is likely to occur to the point of requiring special precautions for the construction, installation and usage of electrical equipment.

Storage - retention of an amount of flammable materials (liquids and/or gases) and combustible liquids in a fixed installation, in deposits, surface, elevated or underground tanks. Retention of an amount of flammable materials, bottled or packaged, in deposits or warehouses.

Relationship between risk analysis and PPRA - consistency, compatibility, harmonization in the recognition and consideration of common risks to both documents.

Commissioning - a set of engineering techniques and procedures applied in an integrated manner to the facility or a part of it, in order to make it operational in accordance with the requirements specified in the design.

Coordination - action of assuming technical responsibility.

Safety distance – Minimum free distance measured on a horizontal plane so that damage is minimized in the event of accidents (fires, explosions.)

Single-family residential buildings - Buildings intended solely for residential use, consisting of a single residential unit.

Building - construction with floors, whose purpose is to house human activities, classified by its type of use in commercial, services, culture, etc.

Fugitive emissions – flammable gas or vapor releases that occur continuously or intermittently during the normal operation of the equipment. Includes releases in pump seals or gaskets, valve couplings, flange seals, compressor seals, process drains.

Bottled - flammable liquid or gas stored in a container, which may be sealed or not.

Simulated exercises - Practical exercises for a more realistic simulation of any accidents, during which the efficiency of the emergency response plan is tested, focusing on procedures, staff training, facility and equipment functionality, and other aspects.

Closed - A product that is sealed in the packaging process in a tight manner so that it will not leak under normal handling, storage or transport conditions, as well as under conditions arising from variations in temperature, humidity or pressure or under the effects of shocks and vibrations.

Process flow diagram - a document containing graphical representation regarding the balance of material and energy flows of raw materials, products, by-products
and wastes of a particular production process.

Facility - an extraction, production, storage, transfer, handling and manipulation unit for flammable materials (liquid and gas) and combustible liquids, of permanent or transitional nature, including all equipment, machinery, structures, pipes, tanks, buildings, warehouses, terminals and other required for their operation.

Sealed - Product that has a label and/or seal that guarantees quality and/or inviolability.

Manipulation - Act or effect of manipulating. Preparation or manual operation with flammable materials, with the purpose of mixing or splitting the products. Manipulation is considered to happen when direct contact of the product with the environment occurs.

Handling - Activity which involves moving flammable materials contained in containers, portable tanks, drums, bottles, boxes, cans, jars and similar elements. Act of handling the bottled, packaged or sealed product.

Identification System - Company-defined identification system such as badge, button, sticker on badge, helmet or work clothing or similar forms.

Methodologies for risk analysis - A set of methods and techniques that, when applied to operations involving process or processing, identify the hypothetical scenarios of unwanted occurrences (accidents), the possibilities of damages, effects and consequences.

Examples of some methodologies:
- a) Preliminary analysis of Hazards/Risks (APP/APR);
- b) “What-if “;
- c) Risk and Operability Analysis (HAZOP);
- d) Failure Modes and Effects Analysis (FMEA/FMECA);
- e) Failure Tree Analysis (AAF);
- f) Event Tree Analysis (AAF);
- g) Quantitative Analysis of Risks (AQR);

Modifications or expansions of the facilities - Any change of the industrial facility that:
- I – modifies the adopted process or processing technology;
- II - modifies the safety conditions at the industrial facility;
- III - physically adapts the facilities and/or equipment of existing industrial plants arising from other productive segments;
- IV - increases the processing capacity of any raw materials;
- V - increases the storage capacity of raw material and products;
- VI - changes the production profile or the final quality of the products.

General layout of the location - a layout that shows the location of the facility inside the land, indicating the distances between the land boundaries and a starting point of the facility.
Service station - a facility where the activity of flammable materials (liquids and gases) and combustible liquids retailer supply is performed.

Operational procedures - A set of clear and sufficient instructions for developing the operational activities of a facility, considering the safety, health and environmental aspects that affect the physical integrity of workers.

Continuous production process - A production system that operates uninterrupted for 24 hours per day through alternating shifts.

Process or processing - Integrated series of operations. The series may include physical and/or chemical operations. The series may involve, but is not limited to, the preparation, separation, purification or change of state, energy content or composition.

Proficiency - Competence, aptitude, ability and skill combined with experience.

Licensed professional - A professional with legal powers for the activity to be performed and assuming the technical responsibility, with a registration in the professional class council.

Facility Fact Sheet - A system organized in order to contain a dynamic memory of the technical information relating to the installations, generated since the design, operation, inspection and maintenance phase, that physically or electronically registers the entire history of the facility or contains sufficient instructions on how to obtain this history.

Container- Receptacle designed and constructed to store flammable products (liquids and gases) and combustible liquids in accordance with technical standards.

Psychosocial risks - A kind of influence on the workers mental health that is caused by the tension of daily life, work pressure and other adverse factors.

Separated by a wall - A storage facility located in a manufacturing facility, but separated from it by a load bearing wall. A storage facility located in another facility and/or building.

Change Management System - A continuous and systematic process that ensures that permanent or temporary changes are evaluated and managed so that any risks arising from these changes remain at acceptable and controlled levels.

Trained workers - Workers with the required qualification and training to perform the activities established in operating procedures.

Transfer - Activity that involves moving flammable materials among containers, such as tanks, vessels, drums, bottles and similar receptacles, through pipes.

Process unit - A production organization that achieves the purpose for which it is
intended through processing and/or transforming materials/substance.