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KLM Technology Group #03-12 Block Aronia, Jalan Sri Perkasa 2 Taman Tampoi Utama 81200 Johor Bahru Malaysia	<b>WORK PERMIT SYSTEM</b>  <b>(PROJECT STANDARDS AND SPECIFICATIONS)</b>	

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## SCOPE

This standard shall be applicable to all hydrocarbon processing / handling installations such as onshore / offshore oil and gas processing plants & platforms, drilling and work over rigs, crude oil and product installations, refineries, oil port terminals, pipelines & pipeline installations, marketing installations, LPG bottling plants, Lube Blending plants etc.

## INTRODUCTION

Working in hydrocarbon processing / handling installation presents special risk and in order to provide safe working conditions and to carry out the work safely, a work permit system shall be followed. The basic purpose of the work permit system is to ensure that work is carried out in the safest possible manner to prevent injuries to personnel, protect property from damage, avoid fire etc

## DEFINITIONS

- a) **Cold Work:** An activity which does not produce sufficient heat to ignite a flammable air - hydrocarbon mixture or a flammable substance.
- b) **Confined space:** It is an enclosure with known or potential hazards and restricted means of entrance and exit, is not normally occupied by people, and is usually not well ventilated.
- c) **Exposure Limit:** Measure of the maximum airborne concentration limit for toxic substances to which person may be exposed without protection (for example, respirator). Exposure limits are usually expressed as parts per millions or milligrams per cubic meter.
- d) **Hot Work:** An activity that can produce a spark or flame or other source of ignition having sufficient energy to cause ignition, where the potential for flammable vapors, gases, or dust exists.
- e) **Issuer:** Designated person authorized to issue work permit.
- f) **Lower Flammable Limit (LFL):** Is the minimum concentration of a vapor in air (or other oxidant) below which propagation of flame does not occur on contact with an

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ignition source. This is usually expressed as volume percentage of the vapor in air. This is also referred as Lower Explosive Limit (LEL)

- g) **May:** Indicates provisions that are optional
- h) **PPE - Personal Protective Equipment:** Devices or clothing used to insulate an individual from the chemical, thermal, explosive, electric shock or other hazards presented by the environment in which one is working. Some of PPEs are Safety goggles, Apron, Safety shoes, Chemical resistant gloves etc.
- i) **Pyrophoric substance:** Substances that ignites spontaneously in air at ambient temperature. In hydrocarbon industry iron sulfide is the most commonly observed pyrophoric substance and is called a pyrophoric iron.
- j) **Receiver:** Designated person authorized to receive work permit.
- k) **SCBA - Self Contained Breathing Apparatus.** It is an apparatus consisting of a suitable mask, combined with a hose and source of fresh air generally in the form of a cylinder of compressed air.
- l) **Shall:** indicates provisions that are mandatory.
- m) **Should:** Indicates provisions that are recommended but not mandatory.  
Implementation of these provisions shall be based upon the consideration of the followings, as appropriate:
- (i) risk / benefit analysis,
  - (ii) company standards,
  - (iii) company experience, and
  - (iv) company philosophy
- n) **Upper Flammability Limit (UFL):** Is the maximum concentration of a vapor in air (or other oxidant) above which propagation of flame does not occur on contact with and ignition source. This is usually expressed as a volume percentage of vapors in air. This is also referred as Higher Explosive Limit (HEL)

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## **TYPES OF WORK PERMITS:**

Based on the nature of work to be performed, the following minimum type of work permits shall be used.

- Cold Work Permit
- Hot Work Permit
- Confined Space Entry
- Electrical isolation and Energization Permit

Composite permit for Hot work and Entry to confined space is described at item 3. Integrated permit for cold / hot / entry to confined space / electrical isolation work etc may be used. However, it shall comply with all the requirements of individual permits

### **1. Cold Work Permit:**

Work falling under the category of cold work such as opening process machinery, blinding & de-blinding, tightening of flanges, hot bolting, inspection, painting etc. shall be performed through Cold Work Permit. This Permit shall be in minimum two copies. The original should be in yellow color and the copy should have the word "COPY" printed in large yellow letters. Original shall be issued to the receiver, retaining the duplicate in the book. Specimen format for the cold work permit is enclosed as Appendix-I.

### **2. Hot Work Permit:**

All hot work such as welding, grinding, gas cutting, burning, shot blasting, soldering, chipping, excavation, open fire, use of certain non-explosion proof equipment etc. shall be carried out through Hot Work Permit. Entry and operation of petrol or diesel driven vehicles or equipment in hazardous area also falls in the category of hot work, and shall be performed under the hot work permit. This work permit shall be in minimum three copies. The original should be in pink color and copies should have the word "COPY" printed in large pink letters. Original shall be issued to the receiver, duplicate to the Fire & Safety Section and triplicate retained in the book. The number of copies shall be four where Fire and Safety sections are separate. For excavation work regardless of the depth, permission from various sections shall be obtained with precautions to be taken for the underground facilities such as; sewers, telephone lines, cables, pipelines etc. Copy of permission for excavation shall be attached to the

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work permit. A feed back system shall be in place to inform all the concerned department /section about the completion of work

### **3. Confined Space Entry permit:**

This permit is required for the protection of personnel entering a confined space such as Vessels, boilers, storage tanks, large diameter piping etc against hazards such as oxygen deficiency, toxic and flammable materials, falling objects, power driven equipment etc. Excavation more than 1.2 meter deep, entry on floating roof tanks when the roof are more than 3 meter down from the top, space located below ground level such as pits, drain channels etc. also fall under the confined space The permit shall be in minimum three copies. The original should be in color different than the cold and hot work permit and other copies should have the word "COPY" printed in large letters. Original copy shall be issued to the receiver, the duplicate to the Fire & Safety Section and triplicate retained in the book. Confined Space Entry Permit shall be supplemented with hot or cold work permit as per the type / nature of work

**Composite Permit** may be used for the various jobs such as hot work outside the confined space, entry to confined space and cold / hot work inside the confined space. The checklist of composite permit must address all the applicable aspects. A specimen of the composite permit for "Hot work" and "Entry to Confined space" is enclosed as Annexure-II. Checklist points of the composite permit may be sectionalized under various heads as given in the specimen copy. Based on the work to be performed, relevant section checklist along with the general section shall be duly ticked

### **4. Electrical isolation and energization permit:**

Before issuing any work permit, it is essential that the equipment / facility to be worked on is electrically safe and electrical power is isolated to the extent necessary for the safe conduct of the authorized work. Permit for electrical isolation and energization shall be in triplicate and in two sections with tear off facility. Section-A shall be used for electrical isolation and Section-B for energization. The original should be in color different than the other permits and copies should have the word "COPY" printed in large letters. Original along with a copy shall be issued to the electrical section for electrical isolation / energization.

Electrical section authorized person on isolation / energization of the equipment / circuit shall return the original to the issuer keeping copy for record. Specimen format for the Electrical isolation / energization is enclosed at Appendix-III.