|  |
| --- |
| 1. **INTRODUCTION TO ELECTRICITY**
 |
| You cannot see electricity, so you often do not know whether something is live or not. An electric shock or current through the human body can cause serious damage (cramps, cardiac fibrillation, burns ...). It is therefore important to always take safety precautions when working with electricity. |

|  |
| --- |
| 1. **EXPLANATION & RISKS**
 |
|  |  |
| 1. Definitions:
* Working (installation, repairs, troubleshooting, inspection) on or near electrical installations or equipment where there is a risk of contact or a short circuit
* High voltage =
	+ > 1000 V alternating current
	+ > 1500 V direct current
* Low voltage =
	+ < 1000 V alternating current
	+ < 1500 V direct current

 | Examples:🡪maintenance work on forecourt (forecourt, cameras, lights, ...)🡪work in the shop (fridge, alarm systems, cameras, ...)🡪HS cabs at depots🡪installations (air conditioning, elevator, ...) in offices and stations🡪electrical parts in car washes**{0>HS<}98{>HS<0}** |
|  |
| 1. The following risks exist (description of the risks + pictograms):
* **electrocution** of persons

**! with high voltage contact is not even necessary !*** **buns** caused by electric arcs
* **fire and explosion**
* **faulty** machines
 |

|  |
| --- |
| 1. **SAFETY REQUIREMENTS**
 |
| **ALWAYS REQUIRED !!!****CHECK** |
| 1. **PERSONAL PROTECTIVE EQUIPMENT**
 |  |
| 1. protective clothing
 |  |
| 1. safety glasses
 |  |
| 1. safety shoes
 |  |
| 1. safety shoes or boots
 |  |
| 1. + when working with power
 |  |
| * + - isolating tools
		- isolating gloves
		- isolating carpet
 |  |
| 1. + with risk of electric arcs
 |  |
| * + - safety helmet
		- mask
 |  |
|  |  |
| 1. **MAIN RULE = SWITCH ELECTRICITY OFF WHILE WORKING**
 |  |
| **TIP**: 5 vital rules |  |
|  |  |
| 1. SWITCH OFF
 |  |
| * + - Make sure that the unit that you are working is switched off.Ensure that is visible that the unit is switched off.
 |  |
| 1. LOCK
 |  |
| * + - Prevent the unit from being switched back on
			* at the switch or disconnection point by prohibiting it from being switched on 🡪 **OR**
			* remove the fuse or lock the fuse
 |  |
|  |  |

|  |
| --- |
| **ALWAYS REQUIRED !!!****CHECK** |
| 1. MEASURE
 |  |
| * + - Do a voltage test on each conductor that forms part of the switched off unit:
			* the result must always be 0.
			* the measuring device must be designed for this purpose
			* test the operation of the device in advance
 |  |
| 1. GROUNDING & SHORT CIRCUIT
 |  |
| * + - Ground and lock each conductor together close to the switched offunit.
 |  |
| 1. DEMARCATE
 |  |
| * + - Apply isolating shielding plates, sheets or other materials to prevent contact with live or open parts of units that are not switched off.
 |  |
|  |  |
|  |  |
|  |  |
| 1. **EXCEPTION = WORKING WHILE LIVE**
 |  |
| **ATTENTION**: ONLY PERMITTED IF the following conditions are met |
|  |  |
| 1. **urgent need** for this must be demonstrated
 |  |
| **AND** |  |
| 1. **express written consent** of KPNWE
 |  |
| **AND** |  |
| 1. the **unit** must be **suitable** for this
 |  |
| **AND** |  |
| 1. a **2nd** person (safety guard) must be **present** - 4-eye principle
 |  |
| **AND** |  |
| 1. **additional precautions**
 |  |
| * + - isolating protective equipment (see 1.e above)
		- protection equipment against electric arc (see 1.f above)
 |  |
|  |  |

|  |
| --- |
| **ALWAYS REQUIRED !!!****CHECK** |
| 1. **OTHER PRECAUTIONS**
 |  |
| 1. always demarcate the work area (cones, ...)
 |  |
| 1. leave the unit in a safe state when finishing work
 |  |
| 1. electrical cabinets
 |  |
| * + - electrical diagram must always be present
		- closed off while no work is being done
 |  |
| 1. special attention (extra risk) required for electrical works:
 |  |
| * + - on ladders : see TSR – Ladders
		- in confined spaces: see TSR – Confined Spaces
		- in (the vicinity of) explosion zones: see TSR - Measurements
		- and storms 🡪depending on the location of the works it should be considered if work should be temporarily halted
 |  |
| 1. signage of risks and restricted access for others
 |  |
| http://www.doehetzelver.be/files/gevaar.jpghttp://www.itminterma.nl/fotos/producten/510.gifhttp://www.nl.bradyeurope.com/images/products/479484.jpghttp://www.bhv4all.nl/contents/media/hoogspanning_niet_aanraken.gif |  |
| 1. **TRAINING**
 |  |
| 1. for working on electrical installations
 |  |
| Training must always conform with local laws - generally classified as:* + - laymen
		- sufficiently-trained/informed persons
		- skilled/authorised persons
 |  |
| 1. safety guard when working live - training in:
 |  |
| * + - recognising risks during work
		- switching off the power supply
		- first aid techniques
 |  |
|  |  |
| 1. **APPROVAL OF MATERIAL FOR WORKING ON ELECTRICITY**
 |  |
| 1. visual inspection (condition of the material) before use
 |  |
| 1. periodic inspections
 |  |
| * + - thorough inspection
		- conforming with local laws (frequency, body)
 |  |

**Kuwait Petroleum North West Europe**

DOCUMENT TITLE: TSR - Electrical Installations

DOCUMENT NUMBER: KPNWE.WI.11.HSCO.083

REVIEW NUMBER: 0

EFFECTIVE DATE: 01 Dec 2017

NEXT REVIEW DATE: 01 Dec 2020

..

**CONFIDENTIALITY:**

The information contained in this document is confidential to Kuwait Petroleum International Ltd. Copyright © Kuwait Petroleum International Ltd. Copying of this document in any format is not permitted without written permission from the management of Kuwait Petroleum International Ltd.

**This document is reviewed and approved according to the released online Document Approval Flow**

|  |  |  |
| --- | --- | --- |
| Prepared by: | Operational Assistant | An Cornelis |
| Reviewed by: | Operational Assistant | An Cornelis |
| Approved by: | HSSE Manager | Gerardus Johannes Marinus Timmers |

# \*Access rights: Generally Accessible [x]

**Reviews Summary**

|  |  |  |  |
| --- | --- | --- | --- |
| **Review date** | **Review reference** | **Review details** | **Review version** |
| **2017-12-01** |  |  | **0** |