Objectives

• Introduction
• Definition
• Regulations
• Requirements for the confined space entry General / Medical
• Need for the medical Fitness
• Medical fitness standards
• Challenges
Introduction

• Confined spaces includes tanks, vessels, silos, storage bins, hoppers, vaults, pits, manholes, tunnels, equipment housings, ductwork, pipelines, etc.

• Inspite of safety precautions Confined Space fatalities are becoming alarming incidents which has to be considered.

• Study done by University of Berkley, center for Occupational & Environmental Health on ‘Protecting workers in Industrial Confined Spaces’
KNPC Health, Safety, Security and Environment (HSSE) Policy

Key commitments to the policy are:

- Perform our work in a safe and environmentally friendly manner, complying with established HSSE systems and procedures and complying with all legal and other applicable requirements.
- Identify all occupational health, safety, security, and environment hazards, evaluate associated risks and implementation controls and programs to minimize these risks to safeguard our workforce, contractors, visitors and community.
- Monitor our work sites to improve process safety.
- Use every opportunity through effective reviews and continually improve our processes, control procedures, behaviors and products.
- Investigate and learn from past incidents and historical practices.
- Assign clear health, safety, security, and environment (HSSE) responsibilities to workers and provide necessary on-the-job and off-the-job training for effective HSE implementation.
- Provide adequate resources and leadership to mitigate and control HSSE concerns.
- Continuously monitor and assess HSE performance, designing continuous and driving for continuous improvement.
- Manage the security of our assets to support the goals of our HSE Management System.
- Effectively implement, maintain and improve HSE management system to achieve our goals.
- Monitor and provide emergency response plans to protect our employees, contractors, public and the environment in the event of an incident.
- Play a part in the accidents and occurrences of the industries with which we are a part to ensure a scar free industry practice.

By 2030, 95% of all our facilities and demonstrate the highest standard of ethical in conducting our business. In doing this, we encourage open communication, participation and consultation within the company and with the suppliers, customers and community. We encourage our employees, visitors and contractors in HSSE activities, with this our to prevent all types of incidents covering occupational hazards, occupational stress, security threats and incidents. Achieving industry leadership in HSSE performance is a collective responsibility requiring total commitment. Every KNPC and contractor employee shall be committed to this goal.
## KNPC HSSE Procedures

### Document Reference Number

**HSE-TSOH-04-1317**

**Document Title**

**Respiratory Protection Program**

<table>
<thead>
<tr>
<th>Author</th>
<th>Updated by</th>
<th>Signature</th>
<th>Date</th>
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<tr>
<td>T. B. Ravi</td>
<td>Industrial Hygienist</td>
<td>J. B.</td>
<td>25/01/15</td>
</tr>
</tbody>
</table>

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**Approver**

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Valid till: Oct 2020 or until next revision

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### Document Reference Number

**HSE-TSOH-11-1349**

**Document Title**

Procedure for Quantitative Respirator Fit Test

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### Document Reference Number

**HSE-MEDOH-04-1344.4**

**Document Title**

Fitness Examinations for Working in Confined Space

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Next Revision due: 04/2019

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**Revision**

**Revision Date**

Rev. 2 Apr. 2016
Rev. 1 Dec. 2012
Rev. 0 Aug. 2014

**Description**

Fitness Examination for confined space - Extensively revised to include KPO-035-01H
Fitness Examination for Confined Space - HSE-MEDOH-04-1344.4

**Revision Date**

Date: 04/03/16

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**KNPC**

Company of the Year 2016
Confined Space – Definition

• Is large enough and so configured that an employee can bodily enter and perform assigned work

• has limited or restricted means for entry or exit

• not designed for continuous occupancy.
Confined Space

**Permit required confined space**: (will contain all of the above, plus one or more of the following)

- Contains or has a potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entrant
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section
- Contains any other recognized serious safety or health hazard.

**Non-permit confined space** "means:" 

A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm. (Machinery cabinets, ventilated tunnels, cooling towers, crawl spaces under houses, drop ceilings etc.,
Confined Space – Hazards

• Toxic Atmosphere – Oxygen Deficiency (rotting of organic matter, rusting of metals, burning), Oxygen Enrichment

• Flammable or explosives

• Toxic gases – Hydrogen Sulphide, CO, CO2 etc.,

• Flowing Liquid or Free Flowing Solids...

• Excessive Heat.( heat Stroke /Heat Stress )
Regulations for Confined Space Entry

- CCOHS-
- The Confined Spaces Regulations 1997 UK
- Confined spaces (A brief guide to working safely- HSE )
- Health and safety Authority (HSA)
- Institute of safety and Hygiene News
- Fitness and Aptitude Assessment Guide lines –Sydney Water
- Confined Space health Assessment Procedures –JISC Mail
- Confined Space Medical –Occupational Health professionals wales
- Confined Space standards regulated by Ministry of Health, Kuwait complying with international standards.
Requirements for the Confined Space Entry

The guidelines identify four general elements:

• Management leadership and employee involvement

• Worksite analysis

• Hazard prevention and control

• Safety and health training
The Golden rules of Confined Space Entry

• Monitor the atmosphere – (electrochem/ infrared sensors, photo/flame ionization detectors)
• Eliminate or Control the hazards
• Ventilate the space
• Use Proper Personal Protective Equipment
• Isolate the Space
• Know the attendants role
• Be prepared for the rescues
• Use Good Lighting
• Plan for emergencies
• Emphasize constant communication.
Medical Fitness for the confined space entrant

- Health Questionnaire including psychological Issues like Claustrophobia, Musophobia etc.,
- BMI
- Blood Sugar
- Urine protein / Sugar
## Need for Medical fitness for a confined space entrant - Activities

<table>
<thead>
<tr>
<th></th>
<th>Activity</th>
<th>Fitness Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Climbing ladders /Stairs</td>
<td>Aerobic fitness is essential</td>
</tr>
<tr>
<td>2</td>
<td>Lowering and raising the ropes</td>
<td>Needs adequate grip &amp; upper limb strength</td>
</tr>
<tr>
<td>3</td>
<td>Communicating via appropriate means</td>
<td>Hearing acuity</td>
</tr>
<tr>
<td>4</td>
<td>Worker Should be lowered with rope and harness</td>
<td>weight should not exceed 130kg including BA</td>
</tr>
<tr>
<td></td>
<td>Need for Medical fitness for a confined space entrant - contd.</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manoeuvring in cramped conditions while using self contained breathing apparatus</td>
<td>Needs adequate body flexibility, adequate physical size and weight, absence of claustrophobia.</td>
</tr>
<tr>
<td>5</td>
<td>Wearing of respiratory protection (SCBA)</td>
<td>Able to maintain positive seal</td>
</tr>
<tr>
<td>6</td>
<td>Minimisation of need for rescue (medical reasons)</td>
<td>cardiac/pulmonary / Neuro conditions evaluated.</td>
</tr>
<tr>
<td>7</td>
<td>Aptitude for confined spaces</td>
<td>anxiety disorders, or other significant psychiatric disorders or phobias.</td>
</tr>
</tbody>
</table>
## Confined Space entrants – 2016- 2017 : (16045 entrants)

### KNPC/SEC

<table>
<thead>
<tr>
<th></th>
<th>Fit</th>
<th>UNFIT</th>
<th>T. UNFIT</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>415</td>
<td>9</td>
<td>0</td>
<td>424</td>
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</table>

### Contractors

<table>
<thead>
<tr>
<th></th>
<th>Fit</th>
<th>UNFIT</th>
<th>T. UNFIT</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15351</td>
<td>106</td>
<td>171</td>
<td>15628</td>
</tr>
</tbody>
</table>
# Medical Fitness Standards

<table>
<thead>
<tr>
<th>S.No</th>
<th>Examination</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age</td>
<td>18-55 years</td>
</tr>
<tr>
<td>2</td>
<td>Height</td>
<td>1.6-1.93 m</td>
</tr>
<tr>
<td>3</td>
<td>BMI = wt/ht</td>
<td>underweight not allowed. up to 35 &gt; 35 - exceeds the Safe Working load</td>
</tr>
<tr>
<td>4</td>
<td>Blood Pressure</td>
<td>&lt;40-155/95, 40-49yrs -165/100, Hypertension controlled is accepted.</td>
</tr>
<tr>
<td>5</td>
<td>Vascular diseases</td>
<td>mild varicosities are Accepted. Extensive vasricosities with eczema and ulceration are not accepted.</td>
</tr>
<tr>
<td>6</td>
<td>Cardio vascular</td>
<td>Any IHD, Valvular Heart Diseases, MI, Any CVS condition causing aggravation due to the extra cardio vascular demands</td>
</tr>
<tr>
<td>7</td>
<td>Resp System</td>
<td>FVC, FEV1 &lt; 70% should be considered. Acute Infections, asthma</td>
</tr>
<tr>
<td>S.No</td>
<td>Examination</td>
<td>Standards</td>
</tr>
<tr>
<td>------</td>
<td>----------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>Visual Acuity</td>
<td>Binocular 6/9 ; near Vision N/12 at 30cm ; Color vision - 2 or &lt; 2 errors ; &gt; than 2 OHP has to assess according to the designation and nature of job. Any eye diseases like Glaucoma, Retinal detachment etc is incompatible. Lens is not permitted.</td>
</tr>
<tr>
<td>9</td>
<td>Hearing</td>
<td>Should not exceed 40db at any freq below 8KHz. Hearing aids ae not permitted. Significant ENT diseases are not permitted.</td>
</tr>
<tr>
<td>10</td>
<td>Speech</td>
<td>Normal Speech with ability to shout and project voice is essential. Chronic Laryngitis/ Stammering /stammer under stress are contra indicated.</td>
</tr>
<tr>
<td>11</td>
<td>Locomotor systems</td>
<td>Any disability which does not interfere in handling tools, performing heavy manual work, wear breathing apparatus, climbing ladders or perform adequate functions expected.</td>
</tr>
<tr>
<td>12</td>
<td>Mental / Emotional Stability.</td>
<td>Anxiety, Claustrophobia, fear of heights, any psychiatric conditions / Alcohol or drug abuse are contra indications.</td>
</tr>
<tr>
<td>13</td>
<td>Medications</td>
<td>Should be asked and its side effects to be assessed that will not interfer in duties or the task assigned.</td>
</tr>
<tr>
<td>14</td>
<td>Chronic diseases</td>
<td>Controlled NIDDM is acceptable, IDDM is not acceptable, HIV,</td>
</tr>
<tr>
<td>15</td>
<td>Neurological disorders</td>
<td>Convulsions, diseases causing vertigo, loss of coordination, loss of muscle power, flexibility, Loss of conscious ness/speech/or mobility are contra indicated.</td>
</tr>
<tr>
<td>16</td>
<td>Skin Disorders</td>
<td>Chronic Suppurative skin disorders, or acute like allergy can be dropped</td>
</tr>
<tr>
<td>17</td>
<td>Beard</td>
<td>Not allowed - with Respirator</td>
</tr>
<tr>
<td>18</td>
<td>Sewage</td>
<td>Vaccination should be done for tetanus, Hepatitis A and Hepatitis B</td>
</tr>
</tbody>
</table>
Challenges

1. Huge number of Contractors
2. Do the private clinics follow the international standards?
3. Do the technicians follow proper procedures and protocols?
4. Are the Nurses and technicians trained in private clinics?
5. Do the Employees Medical History taken properly?
6. Cultural problems – Beard?
7. Is the contractors given health awareness/training (pertaining to the happenings which can arise during the course of work?)
8. Regarding Respiratory Fit Test – do they use the same mask model for test & while using respirator?

9. Are the reports from the clinics genuine?
Recommendations

• Ensure the Medical Fitness is done as per international Standards in private clinics - enforced by ministry

• Ensure Medical fitness is complying the company policy

• Tests should be done by the skilled Technicians (in private clinics also)

• Ensure that the RFT is done for the mask model used by the contractors.

• Audit to be done in approved clinics periodically & if any discrepancies found - strict action to be taken.
Recommendations

- Audit - Contractors medical records / performance competition - HSE Rolling trophy for motivation.

- Adopt the best practices by exchange programs.

- Training and education at management and employee levels.

- The safety personnel shall strictly follow the protocols.

- Emergency team should be available near the entry or confined space premises.
Thank You