FUELS INDUSTRY
Association of South Africa

LEARNING FROM INCIDENT (LFI)

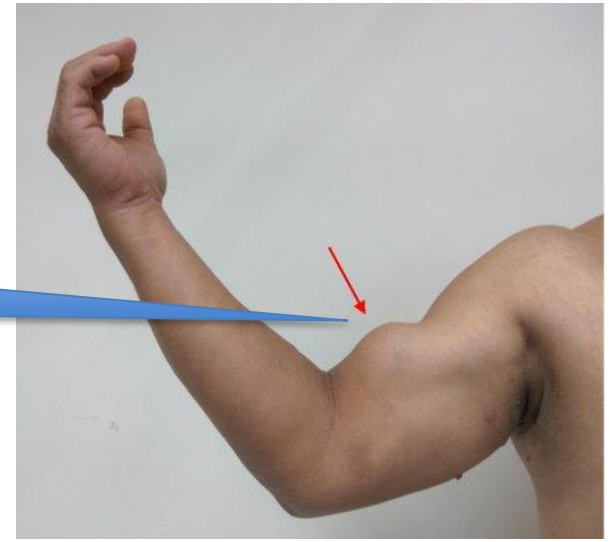
Injury on Duty: Laboratory Gas Cylinder Manual Handling

2024

INCIDENT DESCRIPTION

BRIEF DESCRIPTION OF THE INCIDENT

On the 11th July 2024, a Senior Laboratory Analyst suffered an injury to his right upper arm when he lost control of an Argon gas cylinder during replacement. As the cylinder was rotated, the valve guard suddenly came loose, causing the analyst to grab the cylinder with his right arm to prevent it from falling, resulting in the injury.



Simulated injury: tendon rupture on the right arm

IMMEDIATE ACTIONS

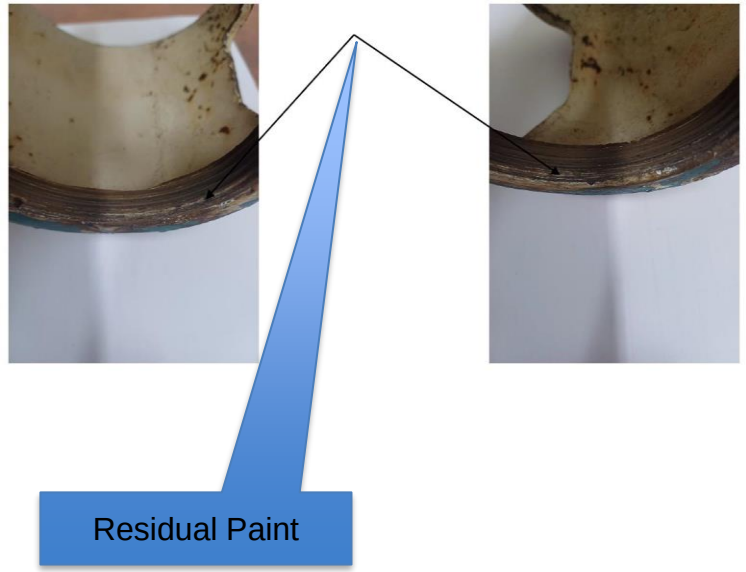
1. The site ERP was activated, and the IP was attended to by on-site personnel.
2. All gas cylinders' valve guards were verified for tightness
3. Immediate assessment of the gas cylinder storage area for safe movement.
4. Gas cylinder change to be conducted by two people in the interim

Loose valve guard

Weight of Gas Cylinder when empty: 61.8 kg

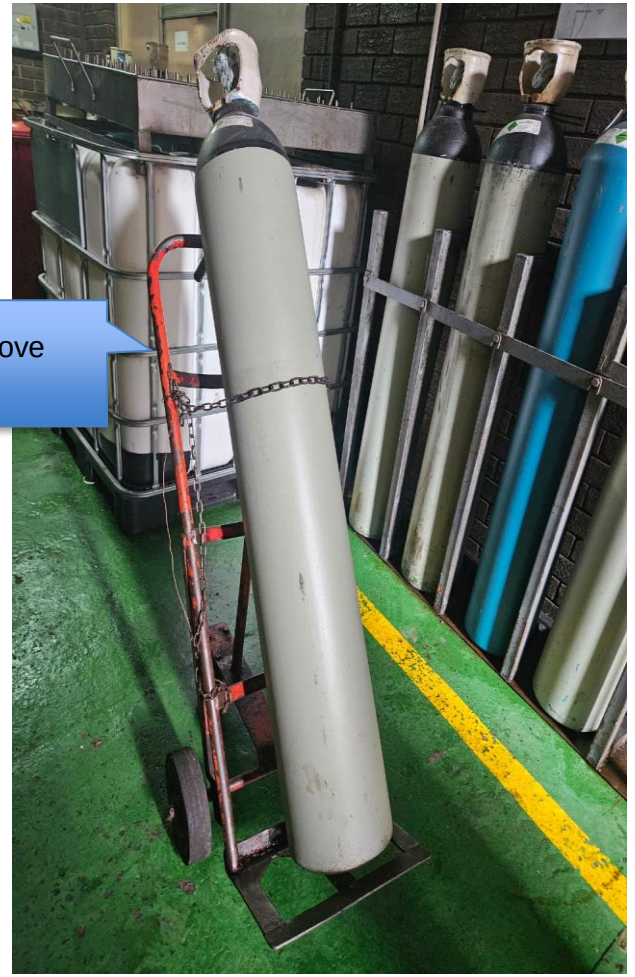
INCIDENT ROOT CAUSE

1. During handling, over time and applying force in rolling cylinders, the valve guard with paint at the bottom threads gave way, leading to a loose valve guard that turned during handling. This was due to inadequate post gas cylinder painting inspection for valve guard re-installation by Supplier
2. The gas cylinder manual handling procedure was not aligned with the industry standard SANS 10263 guidelines. This discrepancy highlighted a knowledge gap, resulting in insufficient (incorrect) training and practices among laboratory personnel.
3. The process for receiving cylinders lacked quality assurance measures, specifically: Lack of pre-handling inspection of cylinders.
4. Lack of Emergency Medical Response: Employee continued with his duties after the incident.



INCIDENT LEARNINGS

1. Risk assessments should encompass all work activities and procedures to ensure they are risk based.
2. The laboratory manual for cylinder handling should comply with the requirements of SANS 10263.
3. The gas supplier must confirm that the gas cylinders meet safe operating conditions upon receipt.
4. Gas cylinder handlers must be competent and responsible for reporting any abnormal or defective cylinders.
5. All employees should remain vigilant and stay "out of the line of fire.“
6. All injuries should be referred to a medical practitioner.



INCIDENT LEARNINGS: SANS 10263-2:2015 Edition 1.1 Annex A

1 **Cylinders are heavy and should be handled with care. Cylinders should not be dropped or subjected to impact when being moved or used.**

To handle cylinders safely you will need specific training in safe handling techniques. Speak to your employer or gas supplier for further information on training that may be available.

2 **Assess the risk before lifting or moving the cylinder**

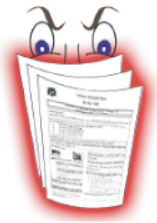
The Occupational Health & Safety Act (Act No: 85 of 1993 amended by Act No: 181 of 1993 and by the Labour Relations Act 1995) was promulgated to ensure health and safety in the workplace and is complemented by the General Safety Regulations it contains see GSR 2(i). This Document identifies the specific precautions to take when moving cylinders in your workplace.

- Ensure that you know the weight of the cylinder being handled.
- Check how far and over what type of surface the cylinder is to be moved. You should clear away any obstructions and debris on the route. Ensure that you know where you want to put the cylinder before you start to move it.
- If the cylinder is to be moved for a distance greater than a few metres, consider using a suitable trolley or other means of transport.
- Wet or cold cylinders are even more difficult to handle as they affect your ability to hold the cylinder securely.
- **BE aware of your limitations**. Ask yourself if you have the ability and technique to safely move the cylinder safely – if not, **SEEK HELP**.

Before handling or using gas cylinders you must understand the properties and hazards of the gas.

Check the cylinder label to ensure you have the correct gas.

The properties and hazards associated with the gas are given in the safety data sheet so take time out to read it. If in doubt ask the supplier for advice.



3 **Always use appropriate protective equipment**, see the safety data sheet. Eyes, hands and feet should be protected when handling or using cylinders. Many injuries to the foot affect the metatarsal (instep) bone. Footwear with metatarsal protection is recommended.

4 **Do not move the cylinder with the valve open.** When the cylinder is empty or you have finished with it, please return it to the supplier. The valve must be closed before transporting.

5 **If cylinders are leaning** over in their pallet or storage bay, do not attempt to straighten them by yourself. Get help and make sure that you know what everyone is to do to avoid trapping each other's fingers or being hit by a falling cylinder.

Always make sure that cylinder restraints are securely fastened after moving cylinders.

6 **Avoid injury by using correct lifting method when raising a large cylinder from the horizontal position**

Foot position: hip width apart with one slightly in front of the other, astride the valve end of the cylinder.

Bend the knees to lower your body. This will enable your thigh muscles to do most of the lifting.

Ensure that the valve guard is secure then take a firm grip using both hands. Only lift using the guard if it has been designed for this purpose, otherwise grip the cylinder neck.

Keep your back straight throughout its length. This does not mean it has to be vertical. Doing this will help to prevent a slipped disc. Pull your chin in so that your back is locked in a straight line and look in front rather than at the ground.

Lift decisively with a smooth non-jerking motion. It is done initially by straightening the legs then following through with the arms at the same time walking forward until the cylinder is upright.

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When the cylinder is upright do not leave it free standing, but move it to a safe storage area.

The "churning" method requires the use of both hands. One supports the cylinder whilst the other rotates the cylinder (away from the body). It requires the cylinder to be tilted slightly (again away from the body). The method takes some practice and should only be attempted on a firm, even surface.

8

NEVER ATTEMPT TO STOP A FALLING CYLINDER -

GET OUT OF THE WAY

Thank you for reading and following this guidance, it will help to ensure your safety.

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Thank You

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