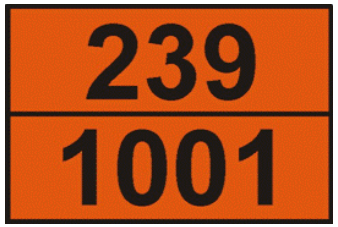
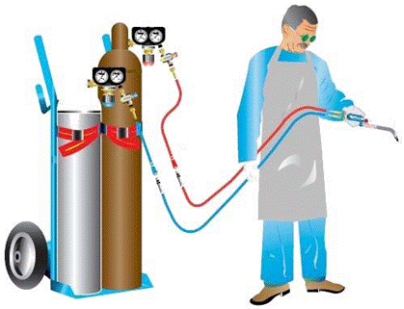
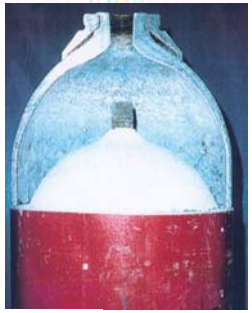
ACETYLENE GAS SAFETY SEMINAR 2010
MALAYSIA







Jointly organised by:

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Vincent Moreau

Regional Engineering and Commodity Manager, South & East Asia

Linde

Vincent Moreau has 20 years experience in the gas industry with BOC and now Linde. He moved from France to Australia with his family where he obtained a Honors Degree in Mechanical Engineering and then a Diploma in Business Management. He has held roles in Production Engineering, in Project Engineering, in Customer Applications, and in the development of non-cryogenics on-site plants. He has managed Technical Services, and now across Asia. Vincent had also established, and was the inaugural Executive Director of the Australia New Zealand Industrial Gas Association (ANZIGA).

Vincent lives in Bangkok with his wife and three children. He also enjoys sport and learning about Asian culture.

EMERGENCY RESPONSE

SOME EMERGENCY SITUATIONS WITH DA

- Fires
- Gas leaks
- Carbide spillage & fire
- Carbide lime spillage & fire
- Generator emergencies
- Cylinder filling emergencies
- Cylinder examination emergencies
- Solvent emergencies
- Severe weather & earthquakes
- Fork lift truck & vehicle accidents

FIRE FIGHTING

What are the most likely fires you could see on an acetylene plant?

Low pressure side:

- Ignition of gas leak
- Fire from open hopper lid when charging carbide
- Hot generator (internally)
- Purifier (or any other) drain valve fire
- Carbide spillage on wet floor
- Lime pit (if carbide is thrown in)
- Generator vent pipe (lightning strike)

FIRE FIGHTING

High pressure side:

- Ignition of leak from cylinder valve
- Ignition of leak from connection on filling rack
- Ignition of gas venting from drier or separator drain valve
- Purge gas venting Ignition
- Compressor gland leak Ignition
- Burst hose
- Bursting disc/relief valve on compressor
- Bursting disc/fusible plug on cylinder

Examination shop:

- Cylinder with valve removed - fire
- De-valving a full cylinder – jet flame
- Solvent spillage fire
- Waste paper labels in scale pit - fire

FIRE FIGHTING

Other types of fire possible:

- Electrical fault
- Spillage of acetone or DMF
- Paint or solvents
- Waste skip
- Fire from mess room cooking equipment
- Clothing

FIRE FIGHTING

General requirements:

- All national and local authority fire regulations shall be followed.
- Fire and emergency drills shall be held on a regular basis.
- Fire protection equipment shall be maintained regularly.
- Systems & procedures shall be in place to prevent uncontrolled acetylene gas escaping into the atmosphere and to control a fire if ignition of acetylene gas occurs.

Fire fighting equipment:

- Dry powder extinguishers are preferred. CO2 extinguishers can create static electricity and are preferred for electrical fires.
- There is the potential for many cylinders becoming hot due to an incident on the filling manifolds so it is essential to have a DELUGE SYSTEM to cool the cylinders in such circumstances.

FIRE FIGHTING

What do you do if there is:

- A fire from a broken filling hose?
- A fire from a leak on the compressor gland?
- A fire from a cylinder valve?
- A fire on the generator hopper?

FIRE FIGHTING

Key safe principles:

- If possible to do so safely, shut off the source of leaking gas
- Leave the fire to burn out
- Keep cylinders cool with water sprays – deluge system or fixed monitor
- If you use a fire extinguisher on a small fire, you need to be able to then safely shut off the gas leak to preventer-ignition/explosion
- Don't take chances

HOT CYLINDERS

How can a DA cylinder become hot?

- Flashback from welding equipment
- Detonation flashing back from pipe work
- Friction from closing the valve after filling
- Severely over filling the cylinder
- Filling too fast
- External heat or fire
- Severe shock or impact such as the cylinder falling from a fast moving truck
- Rapidly introducing high pressure acetylene in to a pipe containing air (or nitrogen)
- Poor cylinder mass

HOT CYLINDERS

Key safe principles:

- Do not move the cylinder or carry it to a water bath
- Do not attempt to open the valve to blow it down
- Stay well away from the cylinder
- Cool with water from safe location – use deluge system or fixed monitors.
- A hand held hose is not a safe option and must not be used
- After 2 hours, use the “wetting test” to ensure it is cool

CALCIUM CARBIDE EMERGENCIES

What do you do if there is:

- Carbide spilt around the hopper?
- A drum splits open spilling carbide on to the ground?
- The carbide is wet and on fire?

CALCIUM CARBIDE EMERGENCIES

Key safe principles:

- Spillage:
  - Keep it dry
  - Eliminate any source of ignition
  - If it has landed in a puddle if water, cover with dry sand
  - Use the spilt carbide in the next generator charge if it is not contaminated
  - If contaminated with sand, spread it thinly on the ground in an open area and leave it to slowly react with moisture in the air
  - Do not throw any carbide in to water, it may explode.
- Fire:
  - Keep it dry
  - Leave it to burn out
  - Fires in acetylene generator skip, hopper and feed should be extinguished with the nitrogen hopper purge system.

GENERATOR EMERGENCIES

What types of emergencies can occur?

- Hopper fire
- Internal generator fire/hot-spot
- Blockage of the carbide feed
- Blockage of carbide lime sludge overflow
- Failure of a drain valve
- Failure of a hoist

GENERATOR EMERGENCIES

Key safe principles:

- Never open up a hot generator to the atmosphere- air ingress can cause an explosion
- If in doubt shut down and call supervisor/manager for guidance
- Correct water level is crucial
- Always check the reason for an alarm sounding

SOLVENT EMERGENCIES

What types of emergencies can occur?

- Spillage from drum
- Tanker hose failure
- Fire
- Environmental damage
- Overfilling tank

SOLVENT EMERGENCIES

Key safe principles:

- Eliminate all ignition sources
- Avoid all close contact with large pools of liquid in of ignition
- Stand back and take time to plan the course of action
- If you get solvent on your clothes, take them off immediately
- Use booms and spillage containment kits to contain spill and prevent it going down surface water drains.
- Only use dry powder or foam extinguishers

CYLINDER EXAMINATION EMERGENCIES

What can happen?

- Gas release when cylinder valve is removed
- Fire when cylinder valve is removed
- Asbestos release

Key safe principles:

- Follow fire fighting guidelines as described earlier
- Be aware of any hot cylinders – follow the cooling procedure

SUMMARY

Don’t take personal risks – its not worth it

Follow the approved procedures

If in doubt – get safely out

Take time to THINK !!!

THANK YOU