GAS SAFETY UK TRANSPORTATION OF GAS CYLINDERS - SAFETY GUIDANCE NOTE

If you transport gas cylinders on (or in) vehicles, via public roads, then the following guidance may be of interest.

By virtue of ADR (the current dangerous goods transportation regulations) the carrying of gas cylinders by vehicle in association with work activities, MAY, depending upon the nature and amount of gas product that is carried, be subject to quite stringent [legally enforcible] safety requirements.

Not surprisingly, transporting gas containers for private or leisure purposes is exempt from regulation. However, for work activities, ADR requires a calculation of 'TRANSPORT UNITS' to be made in order to assess if a work-related journey, where gas(es) are being carried, falls within the scope of Regulations; i.e. if a 'THRESHOLD QUANTITY' has been exceeded.

These may be assessed as follows:

A. Establish which 'TRANSPORT CATEGORY' the gas is in - Category 1 = Toxic Gases, Category 2 = Flammable Gases, Category 3 = Non-flammable & non-toxic gases and Category 4 = Empties.

B. Establish the number of 'TRANSPORT UNITS' for each category of gas; for compressed gases like nitrogen or oxygen, these are based on the water-capacity of the cylinder in litres and for liquefied or dissolved gases like carbon dioxide and acetylene, respectively, these units will be the nett weight of product in kilogrammes.

C. Calculate the total:
No. of cylinders X Transport Units for Each Cylinder = TOTAL

Hence if the load consisted of 3 x 50 litre argon cylinders the total = 150 Units.

N.B. This is quite straightforward for a load where just one of the TRANSPORT CATEGORIES is represented. If the load is 'MIXED' then things get a bit more complicated; a CONVERSION FACTOR is applied to the more hazardous transport catogories (see over).

Modified Toyota Pick-up

The 'correction factor' that is applied to mixed load calculations is: x 50 for most of the toxic gases and x 3 for the flammable gases. Therefore, given a mixed load of:

1 x 10 litre carbon monoxide, 1 x 50 litre hydrogen and 2 x 50 litre nitrogen cylinders the total load would be:
(1 x 10 x 50) + (1 x 50 x 3) + (2 x 50) = 750 TRANSPORT UNITS.

If this total value exceeded 1,000 then the regulations associated with ADR must be fully observed. Below the 1,000 unit threshold, the rules for 'minor' loads would be followed (see below).

The threshold limits for single categories are:

20 TRANSPORT UNITS FOR CATEGORY 1 - TOXIC GASES
333 TRANSPORT UNITS FOR CATEGORY 2 - FLAMMABLE GASES &
1000 TRANSPORT UNITS FOR CATEGORY 3 - NON-TOXIC/NON-FLAMMABLE GASES
(There is no limit on the number of empty cylinders that may be carried - assuming that the vehicle is up to it!).

The system outlined above begs the question 'What do I do now?'

If the number of transport units for mixed or single category loads are BELOW the stipulated threshold then:
A. USE AN OPEN VEHICLE (ideally) OR ONE WHERE THE LOAD COMPARTMENT HAS GOOD VENTILATION - OBVIOUSLY, DON'T TRANSPORT TOXIC GASES IN CLOSED VEHICLE.
B. CHECK THE GAS CYLINDERS PRIOR TO LOADING: MAKE SURE THAT THEY ARE PROPERLY LABELLED, IN GOOD CONDITION, THAT GAS CONTROL EQUIPMENT HAS BEEN DISCONNECTED AND THAT THE CYLINDER VALVES ARE NOT LEAKING.
C. ENSURE THAT THE DRIVER IS TRAINED IN: HOW TO HANDLE AND TRANSPORT CYLINDERS SAFELY, EMERGENCY PROCEDURES AND THAT THEY ARE AWARE OF THE PROPERTIES AND POTENTIAL HAZARDS OF THE GASES THAT THEY ARE TRANSPORTING. IT IS ONLY ADVISABLE TO CARRY PRODUCT INFORMATION (E.G. DATA SHEETS).
D. AS A MINIMUM, CARRY A 2 kg DRY POWDER FIRE EXTINGUISHER.

In the event of an emergency (e.g. a vehicle fire or an accident), the police and, subsequently, the fire service will need to be advised as to the nature of the hazardous load and it's size (i.e. which gases are being carried, what sizes the cylinders are and how many cylinders there are). This will assist the emergency services in protecting both the safety of the public and themselves!
If a cylinder develops a fault (e.g. a leaking valve gland) then the gas supplier/cylinder owner should be contacted - if possible, the vehicle should be parked in as safe a place as possible and, where appropriate, the area should be kept clear until assistance arrives. In the event of a flammable or toxic gas leak it would be prudent to contact the fire service; they'll probably respond quickly and arrive equipped to deal with the worst case scenario.

The information above, should cover the requirements of most of our clients.However, for loads that are likely to exceed the thresholds and, therefore, bring you into the full requirements of ADR, please get in touch and we will provide you with further information.

REGULATOR PRICE LIST. BJ INDUSTRIES LTD (GAS SAFETY UK DIVISION)

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EFFECTIVE FROM: JANUARY 2005

TWO-STAGE REGULATORS

SERVICE GAS	OUTPUT PRESSURE (RANGE)	ORIENTATION	PART NUMBER	PRICE (£)
CARBON DIOXIDE	0 - 2 BAR	SIDE-ENTRY	99-0121	89
CARBON DIOXIDE	0 - 4 BAR	SIDE-ENTRY	99-012	89
CARBON DIOXIDE	0 - 10 BAR	SIDE-ENTRY	99-013	89
HELIUM	0 - 2 BAR	SIDE-ENTRY	99-01010	101
HELIUM	0 - 4 BAR	SIDE-ENTRY	99-010	101
HELIUM	0 - 10 BAR	SIDE-ENTRY	99-0101	101
HIGH PURITY HELIUM	VARIOUS	SIDE-ENTRY	99-0100	288
ARGON	0 - 2 BAR	BASE-ENTRY	99-0191	89
ARGON	0 - 2 BAR	SIDE-ENTRY	99-0191S	89
ARGON	0 - 4 BAR	BASE-ENTRY	99-019	89
ARGON	0 - 4 BAR	SIDE-ENTRY	99-019S	89
ARGON	0 - 10 BAR	BASE-ENTRY	99-018	89
ARGON	0 - 10 BAR	SIDE-ENTRY	99-018S	89
NITROGEN / AIR	0 - 2 BAR	BASE-ENTRY	99-007	89
NITROGEN / AIR	0 - 2 BAR	SIDE- ENTRY	99-008	89
NITROGEN / AIR	0 - 4 BAR	BASE-ENTRY	99-005	89
NITROGEN / AIR	0 - 4 BAR	SIDE- ENTRY	99-005S	89
NITROGEN / AIR	0 - 10 BAR	BASE-ENTRY	99-006	89
NITROGEN / AIR	0 - 10 BAR	SIDE- ENTRY	99-006S	89
ACETYLENE	0 - 1.5 BAR	BASE-ENTRY	99-016	89
HYDROGEN	0 - 2 BAR	BASE-ENTRY	99-0112	101
HYDROGEN	0 - 2 BAR	SIDE-ENTRY	99-0112S	101
HYDROGEN	0 - 4 BAR	BASE-ENTRY	99-011	101
HYDROGEN	0 - 4 BAR	SIDE-ENTRY	99-011S	101
HYDROGEN	0 - 10 BAR	BASE-ENTRY	99-0111	101
HYDROGEN	0 - 10 BAR	SIDE-ENTRY	99-0111S	101
OXYGEN	0 - 2 BAR	BASE-ENTRY	99-01512	89
OXYGEN	0 - 2 BAR	SIDE-ENTRY	99-01512S	89
OXYGEN	0 - 4 BAR	BASE-ENTRY	99-0151	89
OXYGEN	0 - 4 BAR	SIDE-ENTRY	99-0151S	89
OXYGEN	0 - 10 BAR	BASE-ENTRY	99-015	89
OXYGEN	0 - 10 BAR	SIDE-ENTRY	99-015S	89
HIGH PURITY OXYGEN	VARIOUS	SIDE-ENTRY	99-0152	288
MEDICAL OXYGEN	0 - 10 BAR	BASE-ENTRY	99-0031	127
CARBON MONOXIDE	0 - 10 BAR	SIDE-ENTRY	99-0132	127
NITROUS OXIDE	0 - 4 BAR	SIDE-ENTRY	99-014	115

From bbc.co.uk, Friday 15.04.05, 07:35 GMT

'Gas explosion clean up underway'

'Firefighters are damping down at a Derby factory eight hours after explosions ripped through the area.'

'Acetylene cylinders were seen shooting 400 feet into the air by fire crews called to British Oxygen on Raynesway in the city at about 2100 BST.'

'The area was sealed off while remaining canisters were cooled with water to prevent further explosions.'

'It was treated as a "major incident" before being brought under control, Derbyshire fire service said.'

'SEVERAL EXPLOSIONS'

'No one was injured during the fire or explosions, which were triggered when a batch of cylinders fell off a lorry as they were being unloaded with a fork lift truck.'

'The Health and Safety Executive were due to arrive on Friday to carry out a full investigation into how the fire and subsequent explosions happened'

'Derby's ring road was closed for two hours and the neighbouring Rolls-Royce plant was also evacuated'

'A fire service spokeswoman said three of 17 cylinders exploded.'

'A fire crew was expected to remain at the scene for up to 24 hours to damp down.'

For any Doubting Thomas it seems that sometimes mechanical shock leading to thermal decomposition and explosion may occur; we'll wait and see what the official verdict is on this one though.

Perhaps, care in the loading and unloading of cylinders (especially acetylene) should be added to the list of safety requirements for the transportation of gas cylinders by road.

Gas Safety UK (A Division of BJ Industries)
www.gas-safety.uk.com

Of course, always drive carefully too...

And look out for wild animals...

Best regards, David Bayliss.