Bryan Donkin RMG Canada Limited

Safety Guidance on the Installation and Operation of Pressure Control Equipment

General

Regulators and other pressurized components which may contain toxic, flammable or otherwise hazardous media, are potentially dangerous items of equipment, if not operated and maintained in the correct manner. It is imperative that all users of such equipment fully educate themselves as to the potential dangers and satisfy themselves that those personnel responsible for installing, testing, commissioning, operating and maintaining the equipment are competent to do so.

Gas Pressure Regulator

Slamshut Valve

Instruction manuals are available for guidance but assume some basic level of competence by user staff. If there any doubts or ambiguities concerning correct procedures contact your supplier or Bryan Donkin RMG Canada who will be pleased to advise or provide competent service or instructions. **DO NOT TAKE RISKS.**

It should be understood that anything that is stated in this document does not revoke or override instructions that are issued by any other competent or authorized body and reference should be made to all relevant Codes or Practice.

The following comments, whilst not exhaustive, provide guidance as to possible sources of danger to health and safety.

Noise

Regulators, and other pressure reducing devices can generate high levels of noise that can be injurious to people exposed to it for long periods of time. Various recommendations and codes of practice are in existence and users must ensure that adequate precautions are taken to prevent a health hazard to employees or third parties in this respect.

Installation

All pressure containing equipment is designed to withstand the mechanical loads, experienced in normal service (i.e. torque and bending moments in addition to internal pressure). However, care should be taken during installation to ensure the equipment is not subjected to excessive loads that would over-stress the product and may result in a serious failure when the product is commissioned. Excessive stresses can be caused by unsupported lengths of pipe work, or misalignment, and therefore, installations should be adequately supported and carefully aligned.

Pipes must be correctly sized to prevent excessive velocities, normal recommendations in North America are 80 ft/sec for unfiltered gas and 130 ft/sec for filtered gas. Filters should be fitted in systems where there is the possibility of entrained dust and other debris.

Ensure that regulators, slamshut valves, relief valves, etc. are installed with the correct direction of flow.

Pressure sensing lines must be correctly installed in accordance with instructions. Failure to do so can, especially in the case of a slamshut valve, result in excessive pressurization of the downstream system. They require adequate support to eliminate vibration that can result in fatigue or failure. They should also be positioned to ensure they cannot be used as foot or hand holds. They should be slightly inclined so that liquids and condensates drain into the main pipe.

Auxiliary systems should not be tampered with or modified without a full knowledge of the operating conditions and permission from the relevant engineering authority.

Operation

Depending on the mode of operation, the internal valves of regulators may be in the open position. Therefore, when commissioning a regulator, isolation valves should be opened slowly so that the regulator may assume a regulating position. If the valves are opened rapidly, the regulator may not

Respond sufficiently quickly to prevent over-pressurization of the downstream system.

All regulators, etc. should only be fitted with the control or pressure loading spring as specified by the manufacturer. Fitting an incorrect spring, or operating a spring outside its specified range, could result in the spring becoming coil bound. This is specially important when operating relief valves or slamshut valves as incorrect springs may prevent a relief valve from opening or a slamshut valve from closing.

Precautions should be taken to prevent ingress of water through vent and breather holes. Ice on top of a diaphragm may dangerously effect the operation of a regulator, slamshut valve or other equipment.

Maintenance

Pressure control equipment contain gases at pressures that are sometimes higher than atmospheric pressure. Before attempting to investigate problems to service or maintain equipment, it must be safely depressurized or pressurized to atmospheric conditions.

As the gaseous medium may be flammable, toxic, corrosive or otherwise hazardous, it may be necessary to purge the installation with an inert gas, such as nitrogen. Special precautions are necessary for gases such as oxygen or chlorine and the user must ensure that adequate procedures are prepared and implemented.

It is not sufficient to isolate the equipment as high pressures may be trapped between the isolating valves. Do not attempt to remove covers, casing, plugs, etc., before the device has been correctly vented. Even then it is wise to assume that high pressure gas may be present when removing covers and plugs.

Most pressure control equipment use coil springs as a loading device. It is important to reduce the load on these springs by winding back the spring adjuster as far as possible. In certain cases residual load will still be present that may cause the spring to jump up when its fasteners are incorrect. In some cases heavy residual spring loads are present even when the spring is relaxed to its maximum within the confines of the spring housing. In such a case special dismantling screws are provided and it is imperative they be gradually and evenly slackened in turn to allow the spring to fully extend to its free length. Failure to use these dismantling screws may result in damage or personal injury.

On slamshut valves in general the door maybe in the open position and before any maintenance work is carried out, the door should be tripped to its closed position. However on cartridge type slamshut valves it should be noted the unit is removed from the body with the door in the latched open position and before any maintenance work is carried out the door should be tripped to its closed position. Note, the coil spring attached to the door is a loading device and care should be taken when tripping the unit.

The area around regulators, relief valves, slamshut valves, etc., may require to be subject to monitoring in order to detect gas leaks, etc., and due consideration must be given to the installation of gas detecting equipment. The use of naked flames and non-certified electrical or potential spark generating equipment in such environment in such environments is strictly forbidden.

All gas venting points must be piped to a safe location and fitted with an approved flame trap, as must drain lines that may allow the escape of gas.

Consideration should be given to reduce the possibility of static electricity being produced in clothing, to avoid a source of ignition.

Attention

Maximum rated working pressures and temperatures must not be exceeded.

REPEAT – IF IN DOUBT, ASK AND DO NOT TAKE RISKS.

Typical Installation Diagram for a Pressure Reduction System