

## **ALERT**

### **Chemical Cleaning Unit Operated as a Boiler Non-Pressure Equipment Must Not be Pressurized**

We have recently been made aware of an incident in which a worker in Alberta operating a chemical cleaning unit was injured when a valve failed due to excessive pressure.

The worker had been operating a truck mounted chemical cleaning unit. The basic operation of the chemical cleaning unit involves two fluid circuits. The first circuit uses a pump to circulate a cleaning solution from an atmospheric pressure storage tank through a fired heater, where its temperature is increased, and then back into the tank. A second pump is used to circulate the heated cleaning solution from the tank to the equipment to be cleaned. The failed valve was installed in the first circuit. At the time of the failure the valve was closed, and the fired heater was in operation.

The chemical cleaning unit was not designed or constructed to be operated as pressure equipment. However, the nature of the operation was such that it could be misused to heat the liquid in a closed system and thereby increase its pressure, or to generate steam, in a manner similar to boiler operation.

Boilers must be designed, constructed and operated according to the requirements of the Safety Codes Act and regulations. Pressure equipment designs must be registered with ABSA and the construction must be by a certified manufacturer. Boilers must be equipped with safety devices, controls and instrumentation to ensure their safe operation. A boiler must be operated by a competent person, and the operation must be in compliance with the Power Engineers Regulation.

Owner's and equipment operators need to understand the requirements of the Safety Codes Act and the Pressure Equipment Safety Regulations. A boiler is defined as "a vessel in which steam or other vapor may be generated under pressure or in which a liquid may be put under pressure by the direct application of a heat source" (section 1(1)(f)). Also, pressure equipment is specifically designed and constructed to contain fluid under pressure. When air and other compressible fluids are being pressurized, there exists a large amount of energy and a sudden release of this energy will have potentially catastrophic consequences.

All pressure equipment, including pressure equipment that is not regulated under the Pressure Equipment Safety Regulation, must be designed, constructed, installed, maintained and operated in accordance with recognized and generally acceptable engineering practices (RAGAGEP), and be in compliance with other prevailing legislation. For example, employers in Alberta must comply with the Occupational Health and Safety Act and Regulation. Part 3, section 12 of the Occupational Health and Safety Code which provides guidance on specifications and certifications. 12 (a) states an employer must ensure that “equipment is of sufficient size, strength and design and made of suitable materials to withstand the stresses imposed on it during its operation and to perform the function for which it is intended or was designed,”. For more information about the application of Alberta OH&S legislation contact Alberta Workplace Health and Safety (<http://employment.alberta.ca/SFW/53.html>)

In this case, it was fortunate that the worker’s injury was not fatal. Some years ago, a fatality and a serious injury occurred near Edmonton when it was reported that “the men modified a 20 lb propane bottle to use it as a steam boiler”.

Anyone having questions regarding the safe operation of pressure equipment should refer to the Safety Codes Act and Regulations or contact your nearest ABSA office.

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