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SIGNIFICANT INCIDENT REPORT NO: 114

USE OF THE WRONG GAS DURING A ROUTINE INERT GAS PURGE RESULTING IN BURNS TO AN EMPLOYEE

OCCURRENCE

A serious accident occurred at a treatment plant site within WA during the use of gas injection in the purging of a pipe in order to clear a blockage.

The procedure in use required nitrogen to be used as the purging gas since the product to be cleared was a fine particle solid and flammable gas mixture at a temperature that readily ignited when exposed to the oxygen in the atmosphere.

Unfortunately, an oxygen bottle was inadvertently obtained and was connected into the purge circuit in place of the nitrogen bottle, which should have been used.

It was possible to connect the oxygen bottle up to the circuit because the valve outlet threads on both the oxygen and the nitrogen bottles were compatible with those of the gas pressure regulator.

On initiating the purge, high-pressure jet flames cut through from the inside to the outside of valves and pipework. Whilst able to move away quickly, an employee in the vicinity still suffered serious burns through protective clothing being worn at the time.

This incident could easily have resulted in a fatality.

COMMENT

Australian Standard 2473-1996 ***Valves for compressed gas cylinders (threaded outlet)*** is intended to prevent the interchangeability of oxygen and inert gas cylinders by requiring different outlet valve fittings on each of these types of gas cylinders.

In accordance with the current Standard the direct interchangeability of oxygen and nitrogen cylinders should NOT be possible.

Clause 12 of Australian Standard 2473-1996 stipulates that a program of conversion was to be embarked upon by the gas manufactures to convert type 10 outlets to type 60 for air and type 50 for inert gas, leaving oxygen alone with the type 10 outlet up to 174 bar at 15°C.

RECOMMENDATIONS

1) Employees and supervisors should be made aware of this incident, its cause (ie that gas bottle outlets may not be correctly fitted with appropriate valves in accordance with the Australian Standard) and its consequences (serious burns and potential fatality).

2) The conversion program by the gas manufacturers must proceed as a matter of urgency.

3) It is also clear that the users (both employers and employees) of such compressed gas cylinders must also take the appropriate action to prevent a recurrence of this type of incident. Systems must be developed, used and enforced to check that correct gases are being used throughout operations.

4) Careful consideration should be given to the possibility of other potential incidents which might result from the inadvertent use of "wrong" gases, which may be possible as a result of this problem with the valves fitted to gas bottles. A risk analysis should be conducted of all operations involving the use of bottled gases and appropriate risk management strategies should be put in place.

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