

IMPERIAL CHEMICAL INDUSTRIES PETROCHEMICALS DIVISION

SAFETY NEWSLETTER NUMBER 50

By Trevor Kletz

With this issue the Safety Newsletter reaches its Golden Jubilee and completes nearly five years of publication. Although writing it has taken up many hours, the letters I have received have made the effort worthwhile. I would like to thank all those readers who have given me encouragement, comments and suggestions. Although I may not have replied to your letter, it is still appreciated. Can I also thank the managers of the plants on which the incidents occurred, for allowing me to describe their blunders. In some companies these incidents would be hushed up, but this will not stop them happening again. If we want to stop accidents we must be willing to let others learn from our experience.

Common themes during the last five years have been accidents caused by lack of care in preparing equipment for maintenance and accidents caused by misusing flexes, or using the wrong flex. Further examples appear in the following pages.

50/1 WHEN THERE IS A FIRE OR EXPLOSION

DON'T LET THE CROWDS GATHER
DON'T EXPOSE MORE PEOPLE THAN NECESSARY

This has often been said. An incident last year in one of our overseas companies shows that we need to go on saying it.

A run-away reaction occurred inside a small building and produced clouds of vapour. The Fire Brigade were called and stopped the reaction by applying water through an open door. When the emission of fume had stopped a group of men moved forward. Another door was opened. The fume inside suddenly ignited and nine men were burnt.

50/2 A TANKER IS DRIVEN OFF BEFORE THE HOSES ARE DISCONNECTED

It may be hard to believe, but this happens regularly in ICI and in other companies. Now another incident has occurred in the Division. A road tank wagon was left on the plant for filling with liquefied flammable gas. As it had been there for some time the transport supervisor assumed that it would be ready and asked a driver to go and collect it. The driver went to the control room but found nobody there. He could not find the documents so he assumed that the tanker would be ready and that the documents had been left for him at an office near the loading bay. He decided to collect these on his way out.

He went to the tanker and found that the earth lead was still connected and looped through the steering wheel so that he should not miss it. He disconnected the earth lead and drove off, snapping off the filling branch and tearing the flex on the end of the vent line. Fortunately there was no flow through the filling line at the time, though the line was full and the valves were open. The spillage was therefore small. Other companies have not been so lucky, and incidents like this have resulted in serious fires. A portable barrier was provided on the plant but this was not being used.

Could this happen on your plant?

50/3 THE WRONG HOSE IS USED

Earlier Newsletters have described a number of accidents which have occurred because a hose of the wrong material was used. See for example Newsletter 38, Item 2. Now another incident has occurred. A hose made from natural rubber reinforced with cotton was used to convey propylene at 100 psig from a cylinder to a research plant. The hose burst with a noise like a rifle shot and the propylene escaped into the building. Fortunately, it did not explode or catch fire.

The correct hose to use for a duty like this is metal braided hose lined with nitrile rubber, fluon or polythene. Alternatively, flexible stainless steel line can be used. As mentioned before, we can let you have a list of suitable hose materials for the substances we normally handle.

50/4 WHY SHOULD THE CONTROL ROOM DOOR BE KEPT SHUT?

A recent survey showed a number of control room doors propped open or tied open with pieces of string. Perhaps the people who had propped them open did not realise why they should be kept closed.

Most of our control rooms contain sparking electrical equipment. In some of them people are allowed to smoke. If there is a leak of flammable gas or vapour on the plant outside, it is important to prevent this gas or vapour getting into the control room. This is done by sweeping the control room with air. Air is blown into the control room by a fan and leaks out all the time from the various cracks and crevices in the building. As the air is leaking out, gas or vapour cannot get in. If a door is kept open all the time or a window is broken, the flow of air will not be sufficient to prevent gas or vapour getting in.

50/5 WHAT PRECAUTIONS DO YOU TAKE BEFORE CLEANING UP A SPILLAGE?

"When clearances are issued for work to be carried out, the plant or equipment concerned must be in such a state that the work to be carried out can be safely undertaken."

Everyone will agree with this statement taken from a recent accident report, but what do we mean by "work"?

Recently an overhead tank was overfilled and some men were asked to clean up the spillage. They were working just below the tank which was, of course, full to the brim. A slight change in pressure in one of the lines connected to the tank caused the tank to overflow again and some of the contents splashed down on the men. One of them got some on his face.

Before we issue a clearance for breaking into a pipeline we always consider the hazards very carefully. Are we just as careful before we issue a clearance for cleaning up a spillage?

50/6 DATA ON EQUIPMENT RELIABILITY

Newsletter 47/9e reported that the United Kingdom Atomic Energy Authority Data Bank has issued a list of 900 items of equipment on which reliability data is available.

ICI subscribes to the Data Bank and we have access to the data. The AEA like to deal directly with clients so if you would like to obtain reliability data on any item of plant equipment please get in touch with Mr. J.F. Ablitt, SYREL Data Bank, UKAEA, Wigshaw Lane, Culcheth, Warrington, Lancashire, WA3 4NE, Telephone Warrington 31244.

50/7 UNUSUAL ACCIDENTS No. 20

This one originally appeared in Safety Newsletter No. 2.

A man looked for a hose to wash some dirt off his wellington boots. He found one connected to a plant and started to use it. Some of the 'water' got into his boots; unfortunately it was caustic soda solution. Before we laugh, are we sure it couldn't happen elsewhere?

50/8 FOUR YEARS AGO

From Safety Newsletter No. 8, March 1969:

"An exhibition has recently been on show of springs removed from relief valves". Photographs of some of the exhibits have now been issued as Safety Note 73/5, obtainable on request.

50/9 SOME QUOTATIONS FROM PAST NEWSLETTERS THAT READERS HAVE REMEMBERED

"Experience to date suggests that ICI plants are unlikely to be faulted in areas of highly complex technology but may be vulnerable to major consequential losses in more mundane areas".

An insurance spokesman quoted in Newsletter No. 4.

"... had the same imagination and the same zeal been displayed in matters of safety as was applied to sophistication of equipment and efficient utilisation of plant and men, the accident need not have occurred. From the official report on the fire at Esso's West London Terminal, quoted in Newsletter No. 6.

"The hoop had fallen off many times before, but instead of telling anyone the operators pushed it back into position". From the report of an accident which occurred in 1814, quoted in Newsletter No. 38.

"White (Assistant Foreman) in his statement says the procedure was incorrect but at the enquiry gave the impression that the practice was not uncommon, thereby indicating he was aware of it". An accident report quoted in Newsletter No. 41.

50/10 A LOOK BACK - AND FORWARD

The issue of the 50th Safety Newsletter is a convenient time to look back at the changes in safety that have occurred in the last ten years - and to hazard a guess at the next ten.

Compared with ten years ago:-

1. We take much more care over the preparation of equipment for maintenance.
2. We have installed many remotely operated isolation valves so that equipment which is liable to leak can be isolated from a distance.
3. We have improved the lay-out of our new plants, laying them out in blocks with spaces in between so as to restrict the spread of fire and provide access for fire fighting. We now slope the ground so that the spillages run off to one side instead of accumulating underneath the leaking equipment.
4. We have far better facilities for fire-fighting, including new agents such as Monnex, BCF and fluoroprotein foam.
5. We have installed many gas detectors so that we know when there is a leak of flammable gas.
6. We have improved the standard of the equipment used for handling liquefied flammable gases.

7. We have removed the walls from many old compressor houses.
8. We take care, by nitrogen blanketing or in other ways, that flammable mixtures are not present in centrifuges, stacks or hydrocarbon storage tanks.
9. We are much better at reporting dangerous occurrences and telling other people about them.
10. We now employ technically qualified people with operating experience as full-time safety officers and technical safety managers.

All these changes have cost a lot of money. In contrast we have stopped doing a few things we now know are unnecessary. For example, we install a lot of Division 2 electrical equipment instead of more expensive flameproof equipment.

Why have we made changes 1-10? Most of them have occurred as the result of specific incidents. We take more care over the preparation of equipment for maintenance because six years ago a pump was opened up for maintenance with the suction valve open. Hot oil came out and caught fire and three men were killed. We have improved the standard of equipment used for handling liquefied flammable gases because of the fire at Feyzin in 1966. What incidents caused us to make the other changes? See how many you know.

This makes it difficult to forecast the changes of the next ten years as we do not know what incidents will occur. However, here are some changes I would like to see:-

- (a) Clearance certificates are seen by the men who are going to do the job.
- (b) Safety instructions are completely rewritten to make them shorter and easier to understand.
- (c) Plant pressures can be reduced by remote operation when a leak or fire occurs.
- (d) The safety standards of road and sea transport are improved.
- (e) Road tankers are fitted with devices to prevent overfilling.
- (f) Safety Officers enjoy something like the status of personnel officers.

What changes would you like to see in the next ten years? Prizes will be awarded for the best replies.

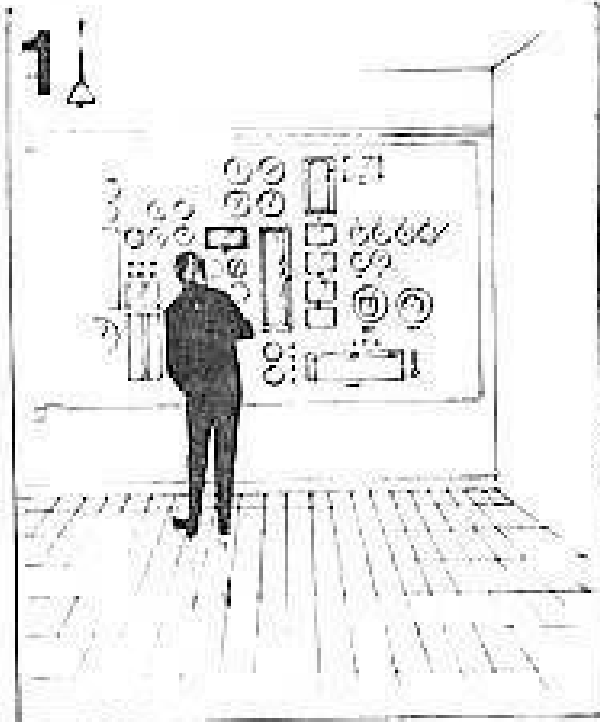
50/11 RECENT PUBLICATIONS

- a) Safety Note 73/3, "Three Weeks in a Works" describes all the accidents and dangerous occurrences, 36 in all, which occurred in one of the Division's Works during a three-week period. It was possible to look at the accidents in more depth than is usual and this showed that more could be done to prevent them happening again.
- b) If you attended one of the discussions held last year on accidents caused by the failure of alarms and trips, you should have received an illustrated "souvenir booklet" during the last few weeks. If you did not receive one, please let us know.
- c) Safety Note 73/4 describes a survey of storage tanks containing hot oil. The survey was undertaken to see if adequate precautions were taken to prevent "slop-over", a rapid vaporisation of a water layer which can blow the roof off the tank and scatter the contents.
- d) Fire Detection Newsletter No. 1 can be obtained from Dr. A.D. Meads, Central Safety Department, London.

- e) Report No. A.128,101, available from Division Reports Centres, describes an explosion in a storage tank containing aqueous ammonia. As the tank did not have a weak seam roof, it failed at the bottom and the entire contents were spilt.

For copies of (a) — (c) or for more information on any other item in this Newsletter please write to Miss M.N, Organic House, Billingham or ring B.3927. If you do not see this Newsletter regularly and would like your own copy please ask Miss N to add your name to the circulation list.

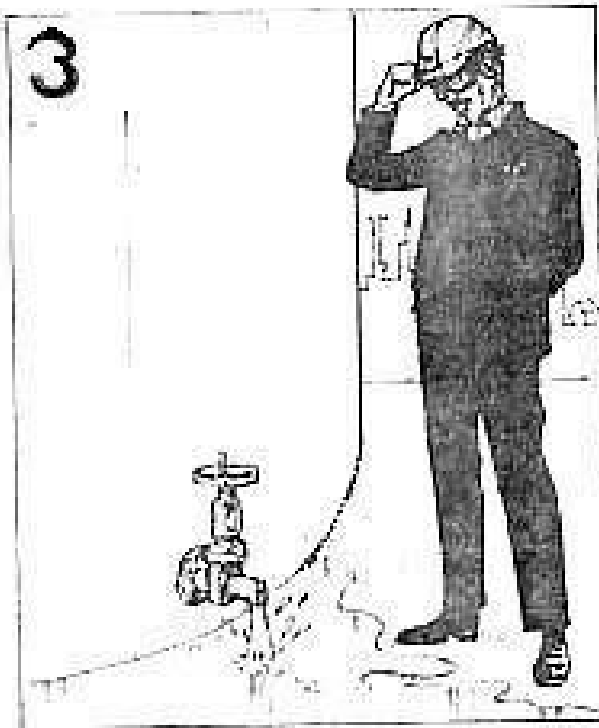
March 1973



1
Morning. Operator noticed tank level was falling too fast. Assumed gauge was faulty and asked Instrument Section to check.



2
Afternoon. Instrument Section checked gauge and reported that it was O.K.



3
Afternoon. Operator looked around and found a leaking drain valve.



4
Ten tons of acid worth £100 were lost to drain