

IMPERIAL CHEMICAL INDUSTRIES PETROCHEMICALS DIVISION

SAFETY NEWSLETTER NUMBER 46

By Trevor Kletz

46/1 UNDERGROUND PIPELINES CAN LEAK SUDDENLY WITHOUT PRIOR WARNING

Nowadays these are constructed to very high standards and are usually wrapped and cathodically protected. Many old pipelines are, however, in use and the following story may serve as a cautionary tale.

An old pipeline was used for transferring product to a storage area about two miles away. It had leaked twice during the past four years but the leaks were soon spotted by the appearance of traces of product on the surface. The leaks were not big enough to show up as stock discrepancies. The line was patrolled once per week to look for further leaks.

During one of these routine patrols, the patrolman found a large pool of product. Further investigation showed that 130-150 tonnes had leaked out over a period of four days and had accumulated in an area which had been dug out at some time and then filled with ash. The hole was on the bottom of the pipe and was about 1/8 to 1/4 inch in diameter. (Calculations confirm that this is large enough to pass the observed rate). The spillage took place over a period of about 4 days and as this coincided with a Bank Holiday weekend the records office had not picked up the discrepancy. report on the incident recommends:-

- 1 Old underground lines which have been known to leak should be abandoned.
2. When products are moved by underground lines, the quantities dispatched and received should, if possible, be compared by the operators concerned. (This is difficult if products are moved into or out of moving tanks).
3. New underground lines have been known to leak because the protective coating has been damaged. Underground lines cannot be inspected and therefore, inside a works area, new pipe lines should be run above ground.

46/2 AN OXYGEN CYLINDER IS SUPPLIED INSTEAD OF A COMPRESSED AIR CYLINDER

Newsletter 41, Item 5 reported that another Division had received a load of liquid oxygen instead of liquid nitrogen. Fortunately, on the Works concerned, all supplies of liquid nitrogen are analysed before they are off-loaded. The Newsletter recommended that all Works should do the same.

A similar incident has now occurred in Petrochemicals Division. A demolition contractor was required to wear breathing apparatus while cutting up an old storage tank. He obtained several large (2,000 ft³) cylinders of medicated compressed air from an outside supplier. Finding that these would be insufficient, he sent a lorry with a written order for another cylinder. When the cylinder was brought into use the welder's face-piece caught fire. He pulled the face-piece off immediately and escaped without injury.

It was later discovered that the cylinder was painted black - the colour for oxygen - and not grey - the colour for compressed air. This had not been noticed by the stand-by anti-gas man. Clearly, supervisors and anti-gas men should be familiar with the difference between compressed air and

other cylinders and should check the colour coding of cylinders before putting them into use.

Compressed air cylinders for use by ICI are usually ordered by one organisation on each site. It is a good idea to make Contractors order their supplies through ICI and not directly from the supplier.

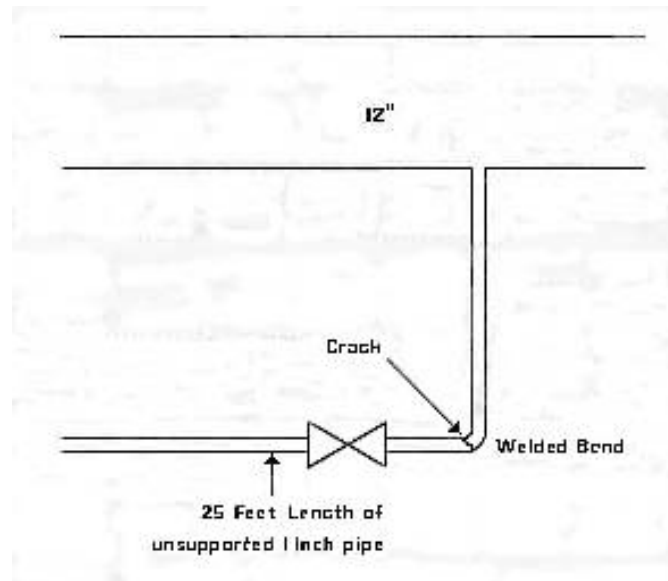
46/3 AN UNSUPPORTED PIPELINE CRACKS AND LEAKS

Newsletter 44, Item 6 described an incident in which a man was killed because a drain pipe was unsupported. Now an incident in the Division shows another danger from unsupported pipes.

A 1 inch diameter branch on a 12 inch diameter main was found to be cracked at a bend, resulting in a leak of flammable gas. Fortunately the plant was shut down before it fired. The crack was due to fatigue, caused by vibration. The unsupported length of line was 25 feet long.

After the incident 20 similar lines were found on the plant concerned.

How many have you got on your plant?



46/4 SPARE PUMPS WHICH START AUTOMATICALLY

A report from one of the oil companies describes two dangerous incidents which occurred because spare pumps, which are supposed to start up automatically when the operating pump stops, failed to do so.

If you have any similar pumps on your plants, do you test them regularly to make sure the spare pump really starts when it is needed?

If you are designing a plant with a pump on it that is supposed to start automatically, have you worked out the reliability with which it will do so? Is this satisfactory? If not, should the reliability be increased by duplicating some of the components?

46/5 STOPPING LEAKS BY FREEZING PIPES

Newsletter 44, Item 5 described how a mixture of Drikold (solid carbon dioxide) and isopropanol had been used to freeze a pipeline containing a liquid of freezing point 5°C in order to isolate a large pump for maintenance.

Agricultural Division have sold Drikold for some years for isolating pipelines containing viscous oils. A booklet describing the technique and further details can be obtained from Mr. G. C. of Agricultural Division (Telephone B.2046).

There is now so much experience in the use of the technique that Agricultural Division feel that some of the precautions suggested in Newsletter 44/5 are unnecessary. They do not consider that freezing should be used only to back up a leaking valve it can be the main isolation but it is a good idea to have a bend or other restriction downstream.

46/6 INSPECTING THE INTERIOR OF A SPHERE

The Mond Division Safety Report for September 1972 describes a novel way which was used to inspect the interior of a large sphere.

The sphere was filled with water and the inside of the top was examined from an inflatable boat. The level of the water was then gradually lowered until the whole of the interior had been examined.

The boat was then given away as the prize in a safety competition. [See also Newsletter 49/3.]

46/7 THE ROBENS REPORT — SECOND THOUGHTS

Newsletter 44, Item 11, gave some extracts from the Robens Report. I have read many articles and reports of speeches on the Report and these have left me feeling that many of the people who have commented on it have not read it.

Most of the comments are favourable but a number of writers and speakers have suggested that we need more law, not less, and that the new Inspectorate should be armed with greater powers. They question if sufficient improvement will be achieved by the use of codes of practice.

The Robens Report proposes that the new Inspectorate should be able to declare any code as conforming to the general purpose of the act (paragraph 152). The Inspectorate can then require an employer to conform to any requirement of the code (paragraph 269).

What greater powers could they be given than these?

46/8 WHAT THE LAW SAYS, No.7

“ANNUAL REPORT OF HM CHIEF INSPECTOR OF FACTORIES”

The report for 1971 has been published by HMSO, price £1. It includes articles on the fire hazards from foam plastics, dust explosions, industrial hygiene and falls from ladders in factories. This last article shows that most people who are injured by falling off a ladder have fallen less than 7 ft. So it is important to secure or foot a ladder even though you are only to go up a few feet. (Similarly you should wear your car safety belt even though you are only going into town. Most road accidents occur within 25 miles of the driver's home).

The following are a few quotations from the report.

“... Britain is one of the safest and healthiest countries in which to work” (page ix),

“Those companies with a clear and stated accident prevention policy, tight control over the performance of working groups, and well-trained workers, supervisors and managers, appear to Inspectors to have both profitable businesses and lower accident rates” (page x)..

“.... industrial health has become a more popular subject, both in fact and fiction, and is increasingly the concern of press, radio and television. For this reason, it is perhaps important to

state that over large areas of industry any risk to health can be eliminated by the vigorous application of soap and water - i.e., by reasonable cleanliness" (page xiii).

The Chief Inspector quotes the following description of a fatal accident which occurred in 1540:-

"A younge childe ... standinge neere to the whele of a horse myll ... was by some myshap come within the swepe or compasse of the cogge whele and therewith was tome in peces and killed. And, upon inquisition taken, it was founde that the whele was the cause of the childes dethe, whereupon the myll was forthwith defaced and pulled downe" (page xv).

He adds that many no doubt feel that this sort of decisive action against bad conditions in industry should be widely applied today!

46/9 THREE YEARS AGO

Before Fire Permits are issued we all make sure that there are no leaks of flammable gas or liquid anywhere near (or no abnormal conditions that make a leak likely). The meaning of "near" depends on the nature of the material, the size of the leak, the slope of the ground, and so on, **but 50 feet** is often used.

One of the HOC Works has just introduced a new rule:

Whenever a Fire Permit is issued for work to be done within 50 feet of the boundary of another plant, the supervisor of the other plant must countersign it.

What methods are used on your Works to make sure that there are no leaks or abnormal conditions in the plant next door? Are these rules O.K. and are they followed?"

From Safety Newsletter No. 14, November 1969.

46/10 WHO IS THE SAFETY OFFICER?

Visiting a Works last year, I called on the Safety Officer. A letter on his desk was addressed to the 'Assistant Safety Officer'. I commented on the error. "No", he said, "on this Works the Works Manager is the Safety Officer; I am the assistant."

46/11 UNUSUAL ACCIDENTS No. 16

A mouse caused a fire in a Scottish research laboratory. The mouse had nibbled a box of matches in a desk drawer and extracted several matches. One match proved more difficult, and during the mouse's efforts to get it out, the match apparently ignited by friction against the remaining matches. The burning matches set fire to papers in the drawer, and to the polystyrene pen tray above. The mouse was luckier than humans often are, in that he escaped from the fire.

From "JoFRO" published by the Joint Fire Research Organisation.

46/12 RECENT PUBLICATIONS

- (a) Report No. 0.200, 772/A available from Division Reports Centres, lists all the safety surveys carried **out in HOC and Petrochemicals Divisions since 1968**. The nature of the surveys and the reasons for them are discussed.
- (b) Agricultural Division Report No. EDN 1320, available from Division Reports Centres, describes some tests on the protection of cables against fire by coating them with thick paint-like materials which are sold for this purpose. The report concludes that these mastic coatings are not recommended and that protection with Durasteel or the use of mineral insulated copper covered cables is to be preferred.

- (c) The Annual Report of Her Majesty's Inspectors of Explosives for 1971 (HMSO, 87p) includes as a supplement a large reference sheet showing the various British and International hazard labels in current use.
- (d) A draft note dated 4 October 72 summarises the causes of a number of furnace tube failures and the recommendations made in the reports.
- (e) One of the Works in the Division has produced a report in cartoon form on the accidents which have occurred this year so far. It has much more impact than the usual Works safety report.
- (f) Project Group Design Note No. 12, Appendix A, summarises the Divisions standards for the isolation of spared mechanical equipment. A series of diagrams show when single isolation is sufficient, when double block and bleed valves are necessary, and so on.

For copies of (d)-(f) or for more information on any item in this Newsletter please write to 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 names to the circulation list.

Our 50th issue may consist largely of extracts from earlier numbers. I would be grateful if you could spare a moment to let me know which, if any, past items have stuck in your memories. Thank you.

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