

IMPERIAL CHEMICAL INDUSTRIES LIMITED

PETROCHEMICALS DIVISION

SAFETY NEWSLETTER No.94

CONTENTS

- 94/1** A fatal accident in another Company occurred because routine tests were not being carried out. Was their importance realised? Should there have been an automatic analyser and a trip?
- 94/2** When a man returned to his normal place of work nobody told him that some lines had been modified while he was away. Would he have been told on your plant?
- 94/3** Did you know that there are two sorts of 3-way cock?
- 94/4** Do your plant instructions look like the one on page 4— or the one on page 5?
- 94/5** Electric wrist watches can be worn on the plant.
- 94/6** Why do we give information on safety to other companies?
- 94/7** Old equipment may contain process materials.
- 94/8** A new fire-fighting material has been invented. It is very effective but could be dangerous. What should we do?

Best wishes to all our readers for a Merry Christmas and a Safe New Year.

94/1 AN EXPLOSION IN A HYDROGEN PLANT

The Health and Safety Executive have published an official report on the explosion which occurred in April 1975 in a plant making hydrogen and oxygen by the electrolysis of water. The equipment on which the explosion occurred is not very common, but nevertheless, lessons of general interest can be learned from the explosion.

As a result of corrosion some of the hydrogen entered the oxygen stream and an explosion occurred. Both the hydrogen and the oxygen were supposed to be analysed every hour for purity, but these analyses were not being done. The Factory Inspectors went through back record sheets and found that when plant conditions changed the oxygen analyses written on the sheet changed immediately, although it would take an hour for such a change to occur on the plant. The management had not noticed this and had failed to impress upon the operators the importance of regular analyses and the serious consequences which could follow if the oxygen purity fell. The report recommends that the purity of both the oxygen and hydrogen streams should be measured continuously and that the plant should be shut-down automatically if they reach a dangerous level. Hourly manual tests are not good enough if a change could lead to an explosion.

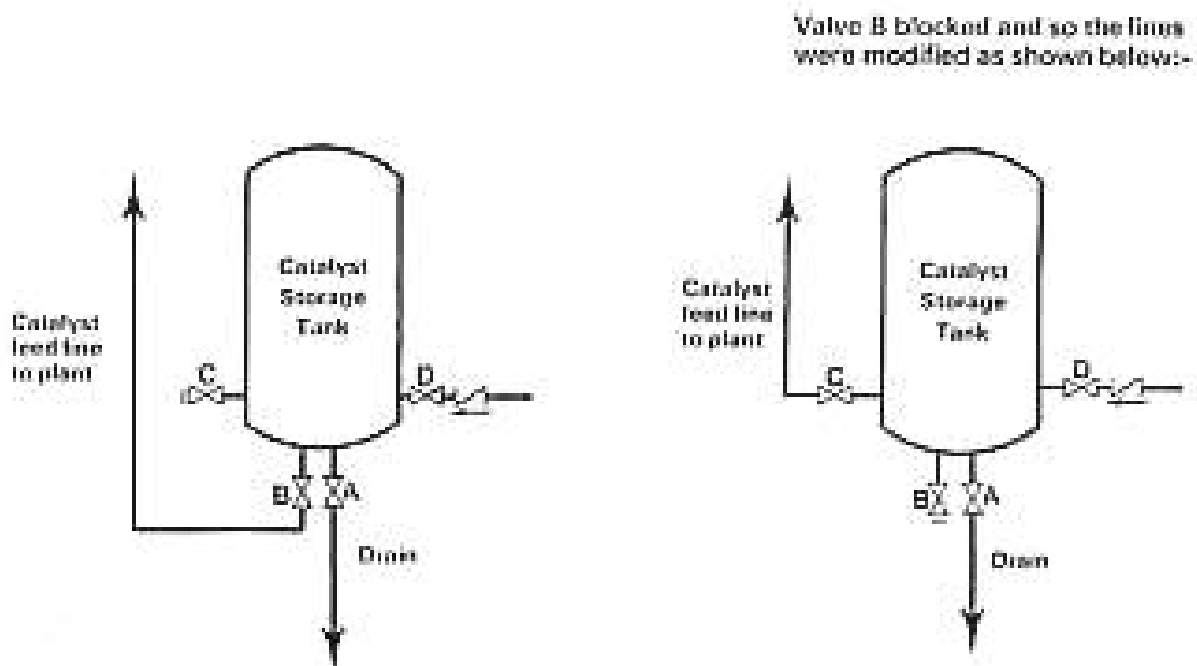
The official report "The Explosion at Laporte Industries Limited on 5 April 1975", can be obtained from HMSO, price £1.25.

Reminder Newsletter 88/1 summarised the official report on an explosion in a steelworks.

94/2 TELL PEOPLE ABOUT CHANGES MADE WHILE THEY WERE AWAY

Newsletter 63/7 described an accident which occurred because some acid and alkali drums were interchanged while a man was away and nobody told him about the change when he returned to work.

A similar incident has now happened in the Division. A small storage tank had the connections shown below:-



An operator who had been on temporary loan to another part of the plant returned to his normal place of work. Nobody told him that the original pipelines had been modified. He was asked to start the feed of catalyst from the tank, a job that used to be done by opening valve B. When he got to the tank

he noticed that something seemed different; he thought perhaps the valves had been turned through 90° to improve access. Clearly the blanked valve was not the feed valve and he opened the valve alongside it, A. The contents of the tank drained into the bund where they reacted with some rainwater. Valve A was finally closed by a man wearing full protective clothing and breathing apparatus, but only after a lot of unpleasant fume had been produced and several tons of a valuable catalyst had been wasted. The report on the incident concludes that the technical side of modifications is well-controlled, but the passage of information to plant personnel relies on an informal and fairly loose system. A better system is needed.

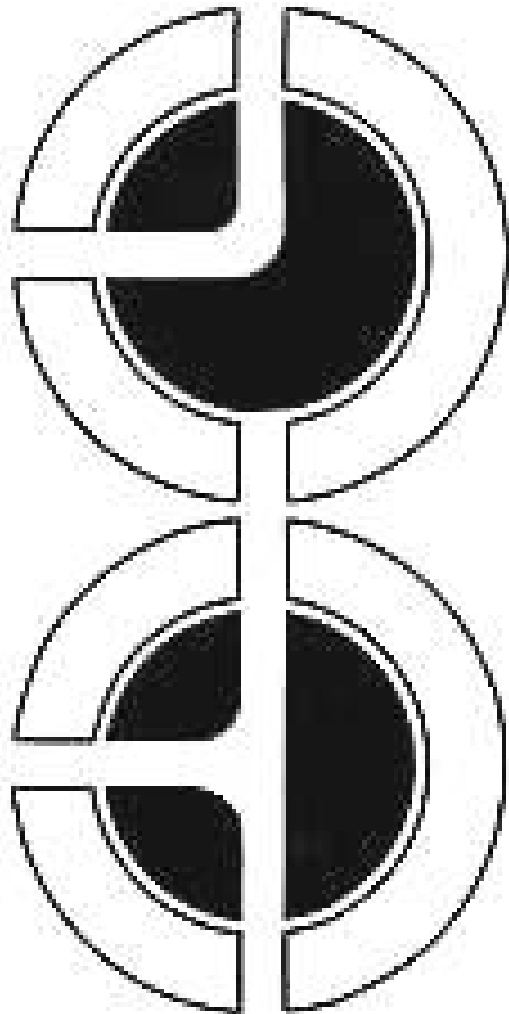
What system do you have on your plant?

94/3 WHAT IS A 3-WAY COCK?

There are two sorts of 3-way cock:

Those fitted with
L-port plugs

and those fitted with
T port plugs



A lot of material went to the wrong place because an L-port plug was fitted instead of a T-port plug. A three-way cock has three openings in the body but sometimes only two in the plug.

If you have any 3-way cocks on the plant, does everyone know whether they are L-port or T-port? Is the right sort in store?

94/4 ARE YOUR PLANT INSTRUCTIONS LIKE THIS?

INSTRUCTION NO: WG 101
TITLE: HOW TO LAY OUT OPERATING
 INSTRUCTIONS SO THAT
 THEY MAY BE READILY DIGESTED
 BY PLANT OPERATING STAFF.
AUTHOR: EAST SECTION MANAGER
DATE: 1 DECEMBER 1976
COPIES TO: UNCLE TOM COBBLY AND ALL

Firstly, consider whether you have considered every eventuality so that if at any time in the future anyone should make a mistake whilst operating one of the plants on East Section you will be able to point to a piece of paper that few people will know exists and no-one other than yourself will have read or understood. Don't use one word when five will do, be meticulous in your use of the English language and at all times ensure that you make every endeavour to add to the vocabulary of your operating staff by using words with which they are unfamiliar, for example, never start anything, always initiate it. Remember that the man reading this has turned to the instructions in desperation, all else having failed, and therefore this is a good time to introduce the maximum amount of new knowledge. Don't use words, use numbers, being careful to avoid explanations or visual displays which would make their meaning rapidly clear. Make him work at it; it's a good way to learn.

Wherever possible use the instruction folder as an initiative test; put the last numbered instruction first, do not use any logic in the indexing system, include as much information as possible on administration, maintenance data, routine tests, plants which are geographically close and training randomly distributed through the folder so that useful data is well hidden, particularly that which you need when the lights have gone out following a power failure.

—OR LIKE THIS?

The following extract from a plant instruction shows the action a supervisor and four operators should take when the induced draught fan providing air to a row of furnaces (known as A side) stops. Compare the lay-out with that of our usual instructions.

ACTION TO TAKE WHEN A SIDE ID FAN TRIPS

- 1 CHECKASIDE FURNACES HAVE TRIPPED
- 2 ADJUST KICK-BACK ON COMPRESSORS TO PREVENT SURGING
- 3 REDUCE CONVERTER TEMPERATURES
- 4 CHECK LEVEL IN STEAM DRUMS TO PREVENT CARRY-OVER

Panel Operator

- 1 Shut TRC's on manual
- 2 Reduce feed rate to affected furnaces
- 3 Increase feed to Z furnace
- 4 Check temperature of E54 column

Furnace Operator

- 1 Fire up B side and Z furnaces
- 2 Isolate liquid fuel to A side furnaces
- 3 Change over superheater to B side
- 4 Check that output from Z furnace goes to B side

Centre Section Operator

- 1 Change pumps onto electric drive
- 2 Shut down J43 pumps

Distillation Operator

- 1 Isolate extraction steam on compressor
- 2 Change pumps onto electric drive

94/5 ELECTRIC WRIST WATCHES

Newsletter 6/4 stated that electric wrist watches can be used in no smoking and de-matching areas. Since that was written in 1968 many more types of electric wrist watch have come into use and I have been asked if the statement is still correct. The answer is that the new types of electric wrist watch are also quite safe to use in no smoking and de-matching areas.

94/6 SOME QUESTIONS I AM OFTEN ASKED

25—ARE WE WILLING TO GIVE INFORMATION ON SAFETY TO OTHER COMPANIES?

We are very willing to give information on safety to other companies. We have published a lot of articles on safety and copies of this Newsletter are sent to many other companies. We contribute to the *Loss Prevention Bulletin* published by the Institution of Chemical Engineers and to other similar publications such as the Institute of Petroleum Safety News (which appears as an occasional insert in *Petroleum Review*).

We do this for a number of reasons. First, we have a moral obligation to do what we can to prevent people getting hurt, wherever they work.

Second, we get back information in return. Other companies send us reports on their accidents and we can then take action to prevent similar things happening in our factories. These Newsletters contain many reports of incidents in other companies.

Third, we spend more money on safety than some other companies and thus impose on ourselves an expense which some of our competitors do not have to bear. By telling them about the things we do, we encourage them to do the same.

94/7 UNUSUAL ACCIDENTS No 61

A gunsmith in Nimes, France was asked to restore a 200 year old musket. As he was trying to free a corroded trigger it moved, the gun fired and shot his wife who was working in the next room.

The gun was last used in 1745 and had remained charged since then.

We do not handle guns in the Works but, in dismantling old pipelines, remember that they may still contain process materials, possibly under pressure. Newsletters 56/1 and 6/2 described incidents caused in this way.

From Mond Division Safety Report, October 1976.

A few copies of our 1977 Safety Calendar are available. It illustrates methods for controlling leaks. If you would like a copy or if you would like more information on any item in this Newsletter please 'phone E.T.(Ext. P.2845) or write to her at Wilton. If you do not see this Newsletter Regularly and would like your own copy, please ask Mrs T. to add your name to the circulation list.

December1976

It is easy to exaggerate the dangers of new inventions and to forget that we have learned to live with the hazards of familiar materials. In Newsletter 70 I reprinted an article which assumed that coal had just been discovered but that nuclear energy had been in use for a long time. In the following, we assume that water, in the pure form, has been unknown — there are no seas, no rivers, no lakes — and has just been discovered.

NEW FIRE-FIGHTING AGENT MEETS OPPOSITION

“COULD KILL MEN AS WELL AS FIRES”

ICI has announced the discovery of a new fire-fighting agent to add to their existing range. Known as WATER (**Wonderful And Total Extinguishing Resource**), it augments, rather than replaces, existing agents such as dry powder and BCF which have been in use from time immemorial. It is particularly suitable for dealing with fires in buildings, timber yards and warehouses. Though required in large quantities, it is fairly cheap to produce and it is intended that quantities of about a million gallons should be stored in urban areas and near other installations of high risk ready for immediate use. BCF and dry powder are usually stored under pressure, but WATER will be stored in open ponds or reservoirs and conveyed to the scene of the fire by hoses and portable pumps.

ICI's new proposals are already encountering strong opposition from safety and environmental groups. Professor Connie Barrinner has pointed out that, if anyone immersed their head in a bucket of WATER, it would prove fatal in as little as 3 minutes. Each of ICI's proposed reservoirs will contain enough WATER to fill half a million two-gallon buckets. Each bucket-full could be used a hundred times so there is enough WATER in *one* reservoir to kill the entire population of the UK. Risks of this size, said Professor Barrinner, should not be allowed, whatever the gain. If the WATER were to get out of control the results of Flixborough or Seveso would pale into insignificance by comparison. What use was a fire-fighting agent that could kill men as well as fires?

A Local Authority spokesman said that he would strongly oppose planning permission for construction of a WATER reservoir in this area unless the most stringent precautions were followed. Open ponds were certainly not acceptable. What would prevent people falling in them? What would prevent the contents from leaking out? At the very least the WATER would need to be contained in a steel pressure vessel surrounded by a leak-proof concrete wall.

A spokesman from the Fire Brigades said he did not see the need for the new agent. Dry powder and BCF could cope with most fires. The new agent would bring with it risks, particularly to firemen, greater than any possible gain. Did we know what would happen to this new medium when it was exposed to intense heat? It had been reported that WATER was a constituent of beer. Did this mean that firemen would be intoxicated by the fumes?

The Friends of the World said that they had obtained a sample of WATER and found it caused clothes to shrink. If it did this to cotton, what would it do to men?

In the House of Commons yesterday, the Home Secretary was asked if he would prohibit the manufacture and storage of this lethal new material. The Home Secretary replied that, as it was clearly a major hazard, Local Authorities would have to take advice from the Health and Safety Executive before giving planning permission. A full investigation was needed and the Major Hazards Group would be asked to report.

Obituary



Jack Banks' many friends were very sorry to learn that he died in November 1976 at the age of 60 after a painful illness.

He retired from ICI in June 1973 after 34 years service, most of them in the Fire Service, the last seven as Fire and Safety Officer on North Tees Works.

Many Safety Officers have a strong sense of vocation, but Jack was in a class by himself. No-one put more energy and enthusiasm into the job. His attitude was infectious and a day with him was a tonic for anyone who was feeling bored or frustrated.

Soon after he went to North Tees Works, before he had had time to make his mark, there were a number of serious fires. Jack worked hard to overcome the deficiencies that these disclosed and he did a lot to raise the standard of fire-fighting, of safety and of morale on the Works. All were very different by the time he left.

When he retired from ICI he set up as a consultant and was able to make his knowledge available to many smaller firms. Unfortunately it was not to be for long.

Whenever we feel fed up or frustrated, let us think of Jack, and remember a man who never seemed to tire or give up, whose drive and enthusiasm never ran out, and remember him as an example.