

# IMPERIAL CHEMICAL INDUSTRIES HEAVY ORGANICS DIVISION

## SAFETY NEWSLETTER NUMBER 9

By Trevor Kletz

### 9/1 IDENTIFICATION OF EQUIPMENT FOR MAINTENANCE

On most HOC Division plants equipment which is given to maintenance is positively identified by numbering or labelling. If the equipment does not have a permanent number or label fixed to it or painted on it then a numbered tag is attached and the tag number is put on the Permit-to-Work. Identification of equipment by describing it or by pointing it out is not sufficient.

Newsletter No. 1, Item 2, described how a plumber broke into a wrong line because the line had not been labelled. A few years ago a man was nearly gassed because he broke into a carbon monoxide line thinking it was a water line.

Two more incidents have occurred in the Division. In the first a plumber was stopped in time while he was hack sawing the wrong line: the correct line had been marked with chalk but the chalk had been washed off by rain. In the second incident, a fitter broke a joint on the wrong line and was sprayed with corrosive chemicals.

Both these incidents could have been prevented by putting numbered tags on the line and putting the number on the Permit-to-Work. This is primarily a process responsibility but maintenance workers should be encouraged not to break into equipment which has not been clearly and unmistakably identified.

### 9/2 MISHEARING ON THE TELEPHONE NEARLY CAUSES AN ACCIDENT

A road tank wagon which had contained LPG was being swept out before being sent to the garage for repair. The laboratory staff were asked to analyse the atmosphere in the tanker to see if any hydrocarbon was still present. The laboratory staff are often asked to analyse the atmosphere inside LPG tankers but usually to see if there is any oxygen present. Owing to a misunderstanding they assumed that an oxygen analysis was required in this case and reported over the telephone "non-detected". The process operator assumed that no hydrocarbon had been detected and sent the tanker for repair.

Fortunately the garage had their own check analysis carried out and this showed that LPG was still present - actually over 1 ton.

For most plant control purposes telephone results are adequate but where analyses are made for safety purposes, results should be accepted only in writing.

### 9/3 A STORAGE TANK IS SUCKED IN

Newsletter No. 7, Item 1, described how storage tank was sucked in because the men concerned did not realise how fragile the tank was and how easily this could happen. The Works concerned has now produced the attached note on the strength of storage tanks which may be worthy of a wider circulation on your Works.

### 9/4 DO OPERATORS KNOW WHY THEY TAKE READINGS?

Newsletter No. 8, Item 2, described a spillage which occurred after a temperature controller went out of order. Many different instruments showed unusual readings; these were copied down on the record sheet by the process operator but he failed to realise that anything was wrong.

Several methods have been suggested for making this sort of incident less likely - in addition to the obvious one of training the operators so that they know why they are asked to take readings.

(i) It has been suggested that the control limits should be printed in red at the top of each column on the record sheet. The operator would be expected to report any readings outside these limits.

(ii) Alternatively, a master copy of the record sheet might be marked up with these limits and displayed in the control room or the limits might be marked on the individual instruments.

(iii) The key readings might be collected together on a "Key Readings Sheet". Our present record sheets are so big that supervisors on their tours do not always look through them systematically. They are more likely to look through a small number of readings on a key readings sheet. (Why have the full reading sheets? The information may be useful to the manager or foreman when he is trying to diagnose the cause of a fault, but on at least one major I.C.I. plant no readings are taken apart from a handful required for record purposes).

#### **9/5 A RELIEF VALVE IS SLIP-PLATED OFF**

After a plant had been on line for two years a relief valve was found to be slip-plated off from the plant. The tag on the slip-plate was very short and did not project beyond the flanges so that it had not been seen when the plant was taken over after construction.

Are there any slip-plates with under-sized tags in the stock on your plant?

#### **9/6 A WATER LINE CATCHES FIRE**

A small fire, in which a man was slightly burnt, occurred recently while a welder was working on the water lines leading to a waste heat boiler. Gas leaking out of a broken joint was ignited by a welder's arc.

The atmosphere inside the water lines had not been tested with an explosimeter as the supervisor concerned did not see how it was possible for gas to get into them.

How did it get in and what should be done to prevent it in future? Turn over when you have thought of the answer.

The waste heat boiler had been taken off-line because of a leaking tube. Before the process side had been isolated and blown down - a passing valve caused delay - process gas leaked into the tubes.

The water side of the boiler should, if possible, be kept full of water until the process side has been isolated and blown down. If the leak is so bad that this is impossible, then the water line must be tested for the presence of flammable gas and the process side must be sweetened so that no gas can leak through while welding is in progress.

Whenever welding is done on water, steam, air or nitrogen lines, the atmosphere inside the lines should always be tested with an explosimeter. Such lines have been contaminated with process material many times in the past.

#### **9/7 COMBUSTIBLE GAS DETECTORS**

Newsletter No. 6, Item 3, and Newsletter No. 7, Item 5, pointed out some of the precautions which should be taken in using combustible gas detectors (explosimeters). These, and other recommendations, have now been collected together in Safety Note No. 69/6, which recommended that Sieger gas detectors are bought in future instead of MSA ones and that all gas detectors are checked immediately before use; an improved test apparatus is illustrated.

#### **9/8 MIXING WATER AND HOT OIL**

In Newsletter No. 3, Item 10, and in a note of 26th August on "Heated Tanks containing a Water Layer", I described the various ways in which a vessel can be overpressured as the result of mixing water and hot oil. For example, if hot oil is added to a tank containing a layer of water, the water will vaporise rapidly and may blow the roof off the tank.

Another company have now reported a similar incident. A reactor was heated by a jacket containing "Thermex". Steam ejectors were connected to the "Thermex" system. Some condensate passed

back from the steam ejectors into the jacket, where it was vaporised so quickly that it split the jacket. The steam ejectors have now been replaced by vacuum pumps.

### **9/9 GOVERNOR FAILURE**

The over-speed trip mechanism on an Elliot turbine failed to function and the governor broke away from the shaft and landed 50 ft away from the machine. The report on the incident recommends that when a governor case has to be fitted on an Elliott turbine it should be a shrink fit with 2 thou. interference as very little positive fixing is achieved by the Allen lock screws.

### **9/10 FAILLURE OF A FLEX COUPLING**

A Fenner flex coupling on a pump broke and threw the coupling guard into orbit. The report on the incident suggests that failure was due to inadequate tightening of the bolts combined with misalignment. It recommends that improved alignment should be achieved in future by using a clock gauge and that normal hexagon bolts should be used instead of hexagon socket head screws as the normal bolts can more readily be tightened to the right degree.

### **9/11 NON-SPARKING TOOLS**

Safety Note No. 69/7 summarises a Nobel Division report and makes recommendations. Copies of this and any of the other notes or accident reports mentioned in this newsletter are available on request. If you would like to see them or if you do not see this Newsletter regularly and would like to do so, please write to Mrs. J.M.W, Room 255, Organic House, Billingham, or telephone B.3927.

### **9/12 THE IMAGE OF SAFETY**

The following extract from a talk by Mr. J.B.R given to a meeting of Agricultural Division Safety Officers in 1966 describes very well the depressing image which the word "safety" conjures up in many people's minds.

"I was a little surprised to realise how much disfavour is reserved for being safe. How so many phrases in everyday use, which include the word, are synonymous with a negative, almost cowardly approach to life - play for safety - to be on the safe side. "Safety First" itself, probably the best known of all safety slogans and once used as the basis of most campaigns, has come to embody a philosophy which is alien to most people. The opposite sentiments - taking a risk - having a go - are much more acceptable attitudes and they have always been. The proverb "nothing ventured - nothing gained" has its more elegant counterpart in the words of James Graham, Marquis of Montrose:

He either fears his fate too much,  
or his deserts are small;  
That puts it not unto the touch,  
to win or lose it all.

I wonder if we have realised how strongly the instinctive feeling is against the broad conception of safety? Do we not, perhaps, reinforce people's intuitive dislike of seeking safety, and of being seen to seek safety, in much of our thinking and actions?

Life is a risky adventure for all of us. Safety can never be our first objective, this must always be some action or achievement; we are encouraged on every side, in innumerable ways, to be bold, to be active, to do things, in fact to take calculated risks. Heroes, people set up for our admiration and whose examples we are encouraged to follow, are most often those who have accepted the challenge of extreme risk. Failure to overcome the challenge by no means disqualifies them for the role of hero."

Can we find a better name for safety and Safety Officer which does not have the overtones of the word "safety"? Some U.S. companies now talk of Risk Evaluation or Loss Prevention and describe their Safety Officers as Risk Evaluation Engineers or Loss Prevention Specialists, but these are clumsy terms. Please let me know if you can think of a better word. A free pair of safety shoes will be given for the best reply.

25th April 1969