

IMPERIAL CHEMICAL INDUSTRIES HEAVY ORGANICS DIVISION

SAFETY NEWSLETTER NUMBER 20

By Trevor Kletz

20/1 IDENTIFICATION OF EQUIPMENT FOR MAINTENANCE

Another Division have reported the following incident.

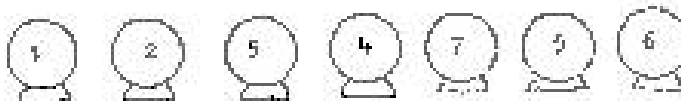
There were seven pumps in a row.



A fitter was given a Permit to do a job on No. 7.

He assumed that No. 7 was the end one and dismantled it. Hot oil came out of the open ends, fortunately while he was having a cup of tea.

The pumps were actually numbered:



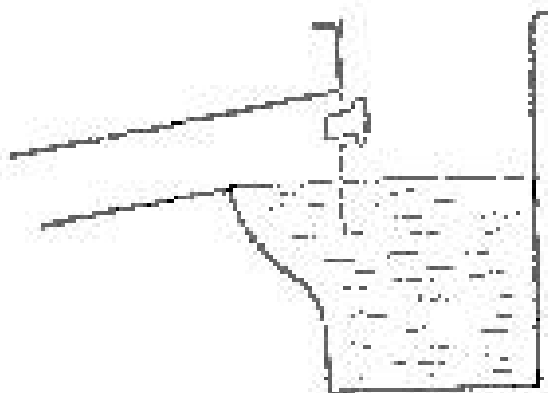
Equipment which is given to maintenance must be identified by numbering or labelling; if there are no permanent numbers or labels then a numbered tag must be tied on. The number of the tag must be put on the Permit and the man who is going to do the job must be given the number.

20/2 A DRAIN CATCHES FIRE

A drain near a furnace caught fire recently, damaging some instrument lines and causing a shut-down of the furnace. Some oil got into the drain elsewhere and came up near the furnace, although there are U-bends on all the inlets.

The U-bends are fitted with by-passes for rodding the drains. The by-passes should be plugged. The plug was missing on the drain near the furnace and in all the other drains on the plant.

I suggest you check your drains.



20/3 ISOLATION OF EQUIPMENT FOR MAINTENANCE

Another Division have reported an accident which occurred on Teesside because equipment as opened up without isolating it from "live" plant.

The chute leading from a centrifuge choked. The operator, following normal practice, opened the inspection port and put his arm in to clear the choke.

While he was doing this, as a result of unforeseen trouble elsewhere in the system, a build-up of pressure caused hot product to be blown up the chute. Fortunately the operator was well-protected and escaped injury.

There was no means of isolating the chute from the rest of the system and no-one thought that a back-flow was possible. The only safe rule is to isolate equipment for maintenance by slip-plates or, if the job is a quick one, by locked valves. (In this case it might be possible to fit a slide valve in the chute.)

This rule is now well established, but incidents like this one occur from time to time because "We didn't think it applied to this equipment" (See Newsletter 12, Item 1 for another example). The rule applies, in H O C Division, to all equipment, whoever does the maintenance, unless another method of isolation has been approved in writing.

20/4 COMPOUND DRAIN VALVES MUST BE KEPT CLOSED

A tank was overfilled recently and ten tons of an expensive product were lost to drain. The overfilling was due to a combination of misunderstanding and failure to follow instructions, but if the compound drain valve had been closed the product could have been recovered and the loss would have been small. Because the compound drain valve had been left open the product was lost.

The purpose of a tank compound is to catch the contents of the tank if it is overfilled or if it leaks. Drains are provided so that rain water can be run off from time to time but the drain valves should normally be kept closed — on many plants they are locked shut and this is the best system.

After rain water has been drained off they should be closed again as soon as possible.

20/5 ROAD AND RAIL TANKER HOSES CAN BURST

Hoses can burst as a result of corrosion, physical damage or attack by chemicals on unsuitable hoses.

Corrosion: A Teflon hose, used for off-loading liquid chlorine from rail tankers, burst last year in Sweden because the woven metal covering had been weakened by corrosion. Two tons of chlorine were spilt and 35 people were affected by the gas, though not seriously, before the tanker was isolated by a man wearing compressed air breathing apparatus. Canister masks were ineffective as the chlorine concentration was so high. A hose used for off-loading liquid anhydrous ammonia from a road tanker burst earlier this year for a similar reason - the internal steel wire braiding had been weakened by corrosion. Three men were injured. Report No. A.127,536, available through Division Reports Centres, gives details.

The reports on both incidents recommend the use of solid steel tubes or steel tubes with articulated joints instead of hoses for these particular duties. If flexes with braided metal coverings or reinforcements are used for any purpose then they must be inspected frequently for corrosion.

The report on the Swedish incident also recommends fitting remote isolation valves in the filling line. Whenever liquefied gases are moved into or out of tank wagons then burst hoses are a possibility to be reckoned with and either remotely-operated isolation valves or excess flow-valves should be installed.

Physical Damage. The biggest single cause of burst hoses is the tanker moving off before filling is complete. An incident of this sort happened recently in the Division.

A road tanker had to be filled with LFG. There was some delay in starting loading and the driver grew impatient. Finally, the operator said to him, "You're on your way". The operator meant that filling had now started but the driver took it to mean that loading was completed, got in and drove off, breaking the hose.

This incident shows the need for a tightening up of procedure (could it happen to you?) and reinforces the case for excess flow valves or remotely-operated isolation valves.

Chemical Attack on Unsuitable Hoses: Many hoses have burst for this reason. As mentioned in Newsletter 10, Item 10, we can let you have a list of suitable materials for hoses, tank linings, gaskets, valve seals and drum seals.

20/6 NEVER SPLASH FILL FLAMMABLE LIQUIDS

A lot of engineers do not know that flammable liquids must be introduced into storage tanks through dip pipes which remain submerged whatever the level in the tank. If a hydrocarbon liquid is splashed into a tank, a charge of static electricity can be built up on the liquid and this can cause a spark which will ignite the vapour.

Although the tank will be earthed, this will not prevent a spark occurring inside the tank.

Splashing may cause a mist to form and this can reduce the flash point by as much as 50°C — so that a high-boiling liquid like kerosene becomes explosive. It is also possible that an electric discharge might take place from the mist (rather like lightning); this might occur even with conducting liquids such as non-hydrocarbons, because the droplets are not in contact with each other and cannot lose their charge.

So remember — never splash fill.

The fill-pipe should enter through the side of a fixed tank, not through the roof. If an explosion should occur the tool will be blown off and we do not want the fill pipe to break as it may be in use.

20/7 SLIP-PLATES AND SLIP-RINGS

In Newsletter 14, Item 7, I described a new standard for distinguishing between slip-rings and slip-plates. There have been so many objections to this new standard that it has been decided to go back to the old one, modified slightly. So once again, slip-plate tags will have a tag with one hole in it and slip-rings will have a tag with two holes in it.

One of the objections to this system was that on lagged lines the two holes on a slip-ring tag could not be seen and it might be mistaken for a slip-plate. So in the new standard the tags will be made longer. Copies of the new standard can be obtained from Standards Section, H O C Engineering Dept.. No. TDH 2400, Issue 3 for Class 300 piping and No. TDB 2401, Issue 3 for Class 300 piping. Spectacle plates will normally be used for Class 600 and heavier piping.

20/8 PHONE XXX IF YOU HAVE A SAFETY PROBLEM OR SUGGESTION

Most Works have safety hazard books and/or safety suggestion schemes. One H O C Division Works is trying out a new method to encourage people to report hazards and put forward suggestions. A special safety telephone number has been linked to a tape-recorder and anyone who has a hazard to report, a suggestion to make or a problem to discuss, can dial the number and record his message at any time, day or night.

20/9 “TREM CARDS”

“Tremcards” or Transport Emergency Cards are carried in the cabs of road tank wagons. They give information on the cargo, the action to take if there is an accident, first aid information and a telephone number to ring for help. They supplement the information on the tanker’s label. (Specimens on request from Mr. E.E. J, H O C Distribution Dept., Extn. B.2466).

Tremcards will soon be available for all hazardous products and will be used by all Companies, not just ICI.

If you are on the scene of a tanker accident, look for the Tremcard.

If you are responsible for filling road tank wagons, make sure the driver has his Tremcard and make sure there are no old ones in the cab

20/10 RECENT NOTES

(a) Engineering Department Project Group Instruction No. 2.13, summarises the essential safety matters that must be considered during the design of each project. The instruction deals with the detection of leaks, the isolation of leaks, the control of spillages, ventilation and layout.

(b) Safety Note 70/10 describes the precautions to be taken against static electricity during the gauging and sampling of storage tanks containing flammable hydrocarbons above their flash points. It is based on recommendations made by the Institute of Petroleum.

(c) Two notes report recent conferences on static electricity: "Notes on the 1st International Conference on Static Electricity" (Safety Note 70/8) and "Notes on a Meeting to discuss Hazards from Static Electrification, held in the Institution of Electrical Engineers on 8th April 1970" (Safety Note 70/5).

(d) Report No. 0.21,176/B by J.F. M surveys the transportation of H O C Division products by ship and makes a number of recommendations. It is available through Division Reports Centres.

(e) Technical Data Note 2/69, published by the Factory Inspectorate, lists "Threshold limit values" for 1969 and replaces the list given in 'Dust and Fumes in Factory Atmospheres'. It is available from your Safety Officer.

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

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