

There is a copy also in SBT files

# Management accountability for accidents

by Professor Tom Boyde, Hong Kong University, Dept of Biochemistry

THIRTY years ago and then some, when stationed at RAF Cosford, near Wolverhampton, I was much struck by an item in the local paper. An entire family of six people had been killed when their house was destroyed by an explosion, due to town gas, which had leaked from a nearby main and tracked its way into the house under ground. They weren't even customers of the supply company, so it all seemed a bit hard. Harder still to bear was the coroner's expressed view that this was an Act of God, whereas I thought then and still think that it was obviously an Act of God Board, who had some gas in some pipes, where it belonged, and let it escape into a place where it didn't belong.

The attitude of that coroner was pretty much representative of popular opinion. Accidents were supposed to happen by pure chance so that no-one was really to blame, though in fact those engaged in the detailed investigation of accidents on the roads, in the air or in industry knew very well that a precise chain of causation could always be found. Their reports rarely reached the public eye. If they did it might be only in a civil court where the defendant company or individual sought to avoid blame, because a finding of negligence would be both costly and damaging to reputations.

Such cases are rarely illuminating and never elevating; nor do they lead to provisions against future recurrence. They invariably come to turn on some petty point of law or conduct, never upon a broad view of the entire history, and anyway the spectacle of people grubbing for money is hardly pleasant.

Is there a change in the air? In three recent cases in Britain, official investigations have dug deep into the managerial customs and the social culture of great industrial concerns to try and get a better understanding of the background against which a particular physical set of circumstances led to disaster. The conclusions are remarkable and the lives of British executives and directors will never be the same again.

## The Clapham Junction railway accident

Thirty five people died when a fast train coming up to London from Poole ran into the back of a stationary train, standing just outside Clapham Junction on 12 December, 1988. It happened because of a faulty signal, and that fault arose because of the work of a senior technician who had been installing a revised and somewhat improved signalling system.

Knowing that, you might think, would be the end of it. But Mr Antony Hidden QC, the admirably-named inspector who led the inquiry, thought otherwise and his report contains ringing and stringent criticisms of British Rail management almost from bottom to top.

The technician had never had any formal training, was essentially unsupervised, and his work was not independently checked according to the procedures well recognized in the railway world.

- Junior staff like himself worked enormous overtime hours and virtually ran the week-end programme by themselves, making their own rules. Some key stages of re-signalling must obviously be done on Sundays only.
- Experience from previous (non-fatal) incidents of almost the same kind did not lead to improvements. There was extremely poor communication within management; up, down and sideways.
- The very sensible recommendations on safety matters of various internal meetings were not followed up; the practical outcome of management directives was not monitored; formal departmental instructions on technical matters were not read; and, job descriptions were lacking or of little use.
- Safety was a buzz-word in senior management, but nothing effective was being done to ensure it. The concepts of safety management and quality systems were not understood.
- Although clearly recognized as essential for safety, the re-signalling programme, automatic train protection systems and driver or "cab" radio, had all been delayed for many years for financial reasons.
- Continual reshuffling of management structure, four times in six years, left many and perhaps most of the junior management personnel of the signals department frustrated and confused, mainly because of the ham-handed way in which the changes were made.

Without being visibly unfair to any individual, Mr Hidden shows how the combination of their failings led to such terrible consequences. One clear positive feature, however, was the uniformly cooperative and helpful spirit in which all the BR witnesses responded to the enquiry. None made any attempt to cover his traces or escape responsibility.

## BP Oil (Grangemouth) Refinery Ltd.

Within a three month period from March to June 1987, there were three separate fatal accidents at the Grangemouth refinery and the storage depot at Dalmeny, near Edinburgh. The oil business is intrinsically hazardous and there are carefully designed safety rules and procedures: also, the hazards are so obvious that one might reasonably expect everyone concerned to follow those procedures in his own self-interest. Then what went wrong?

## Fire at Dalmeny

As it happens, the dead in all three incidents were all contractors' men, working in the plant on maintenance projects, but in only one case does any blame belong to these "outsiders" to the industry and that was where one of the gang employed in cleaning out the sludge from the bottom of an empty crude-oil storage tank dropped his lighted fag-end. Believe it! Actually smoking on the job. He survived and only owned up after the investigation team had spent some time trying to find a more probable source of ignition. The dead man was one of his work-mates, a non-smoker.

Notices and various safety documents clearly prohibited smoking except in specified areas and required the surrender of lighters and matches at the gatehouse. But the gate was unmanned, being under video surveillance, and it had become customary for the men to evade this and other safety requirements, and to smoke where they thought fit. Supervision both by the contractor and by refinery staff was clearly insufficient and the oil company received implied rebukes about several aspects of their control and contractual arrangements.

## Explosion

Far more serious in respect both of financial loss and the potential for injury to the public was the explosion of a "low-pressure separator" in the hydrocracker plant at the refinery. Large pieces of debris, weighing over a ton, fell up to one km away. One of these killed a man. The explosion was due to a fall in liquid level in the preceding unit in the sequence, so that high-pressure gas could pass through to the separator. This occurred because of :-

- inadequate, old-fashioned control valves;
- non-approved modifications to automatic safety features on those valves (shades of Chemobyl!);
- lack of additional automatic cut-off valves;
- liquid-level gauges which did not agree with each other or with the true level of liquid;
- faulty low-level alarms, known for months to be so;
- and, operator error when dealing with a somewhat unusual situation in the plant. Blowing through with high-pressure gas was done occasionally to clear the pipes, though known to be dangerous. Under the particular circumstances, with outflow pipes from the separator shut off, it was doubly dangerous. But probably that was what they were trying to do.

Operators attempted to cover up their errors by re-setting certain controls before the investigating team arrived, and lied to the investigators about the sequence of events, which were therefore reconstructed from physical evidence. Probably



## FEATURE

also it was an earlier generation of operators who had disconnected certain safety features in the control valves, to save themselves the trouble of going outside to reopen valves manually. Safety inspections and audits had identified those illegitimate modifications and various design faults, even several years previously, but nothing was done about it.

The company was sharply criticised for these and other failings, notably in the training of operators, monitoring of control-room practices and the proper safety assessment of modifications to the plant. When charged in court under the Health and Safety at Work Act, they were fined L500,000.

### *Fire at Grangemouth*

In this case, contractors' men had to remove, from an above-ground pipeline, a huge valve which had been found faulty in service. The pipeline should have contained only vapour, and at low pressure; instead it was full of highly inflammable liquid of which some 20 tons spilled out and caught fire because the diesel compressor supplying air for the breathing apparatus to the men was not properly spark-proofed. Two men died.

The company was sharply criticised for many features of their safety management; delegated to too low a level and conducted without sufficient care, insight or detailed knowledge; and the failure to instal a safer type of valve with a built-in indicator to show whether it is properly closed.

Even if only the means of escape had been better, these two men, and also the one at Dalmeny, might have survived. If the supervisors had suspected that scale could be blocking valves and smaller-diameter pipes (a well-known hazard), there would have been no fire.

This time, the company was fined a mere L250,000.

### **The Zeebrugge Ferry Disaster**

This case is much better-known than the others. The "Herald of Free Enterprise" was a vehicular ferry operating between Belgium and England. It left the Belgian port with its bow doors still open, and although the sea was almost completely calm a sudden inrush of water made the ship so unstable that it tipped over on its side. Over 200 people died.

The man whose job it was to close the bow doors was asleep on duty, but no-one else checked that the job had been done.

In a capsizing accident of a similar type of ship, at Harwich in England, a few years earlier, only six people died. But then it was winter and there were fewer people on board. In neither case was the water even deep - both ships came to rest on the bottom of the sea with one side above water.

Questions have been raised about the safety of the bow-door system and also the stability and other characteristics of these flat-bottomed vessels with an enormous open car-deck, not subdivided, where a few hundred tons of water sloshing about can create horrifying problems.

Manslaughter charges have been brought against the directors; repeat, the directors of the ferry company.

### **What about Hong Kong?**

When was the last time directors or senior management of any big company in Hong Kong ever got the blame for anything? Even when caught with their fingers in the till? Sometimes one comes across situations where a business dares not operate normally because the risk of being taken to court is so great.

That is ridiculous, but the opposite is equally ridiculous. Lower echelon management and ordinary employees each have things for which they are responsible and for which they must take the blame if the job is not done properly. Senior management also has an area of responsibility, namely to manage, and should be held fully accountable in the event of failure to apply proper standards.

### **Reading**

*Investigation into the Clapham Junction Railway Accident Anthony Hidden QC, HMSO 1989*

*The Fires and Explosion at BP Oil (Grangemouth) Refinery Ltd Health and Safety Executive, HMSO 1989.*

*Quality Systems BS5750. British Standards Institution, 1987. (Related to International Standard ISO 9000-1987)*

