

## CORNER 7: PHYSICIAN, CURE YOURSELF

*It is perhaps the most endearing characteristic of gurus that they seem to benefit least from their own wisdom.* – Nicholas Shakespeare (2005) (As an example he quotes Dr Robert Atkins of diet fame, who became obese.)

I agreed to edit a special issue of a process safety journal that would be devoted to human factors and management. It was scheduled for publication in May 2006. The publishers told me that to allow time for refereeing and subsequent changes papers ought to be submitted no later than the beginning of August 2005. So in April 2005 I contacted a number of possible contributors by telephone, email or personal contact and also posted an invitation to contribute on the Internet. Nine people agreed to write papers and another three said they hoped to do so. Six of the twelve actually produced them. In addition another two authors who did not hear about the special issue until later managed to produce papers within a reasonable time.

Several people have told me that my success rate of 50% of the original twelve is about par for the course. But my potential authors were not typical authors of papers for scientific journals. They were all experts in human reliability whose well-deserved reputations (and bread and butter) have been earned by their skill in observing others, diagnosing the reasons for errors, including errors of omission, and suggesting ways of reducing them either by removing opportunities for errors or preventing people making them (most often the latter). One is tempted to say, "Physician, cure yourself". Have any of them, I wonder, ever realised that they might learn something about human error by examining the reasons for their own errors? Before we discuss this let us look at the reasons for human errors and the actions needed to reduce them. The following classification is useful because it classifies errors according to the actions needed to prevent them. My book, *An Engineer's View of Human Error*, describes them in more detail.

**1 Mistakes** are errors that occur because someone does not know what to do. The obvious remedy is better training or instructions but we should first see if the task can be simplified.

**2. Violations** (also called non-compliance) occur when someone decides not to follow instructions or recognised good practice. The obvious remedy is to explain the reason for the instructions or good practice as we do not live in a society in which people will uncritically obey instructions for which they do not see the need. However, we should first see if the task can be simplified as if as if a wrong method of carrying out a task is easier than the correct method the temptation to use the wrong method is great, especially when it has been tried and seems to work.

**3 Mismatches** occur when the job is beyond the physical or mental ability of the person asked to do it, perhaps beyond anyone's ability. Common causes are overload, underload (the night watchman syndrome), being asked to break habits and mind-sets. We should change the work situation, that is, the design of the equipment or the method of working.

**4 Slips and lapses of attention** occur to us all from time to time especially when we are distracted or stressed. Again, we should change the work situation so as to remove or reduce the opportunities for error. Telling people to take more care is useless. No one is deliberately careless.

The authors who failed to produce promised papers suffered from overload. They told me that they had been too busy, that is, they had undertaken or been given more work

than they had time for. Their failures were therefore a type of mismatch. If this happens to the experts perhaps it can also happen to others. However, it is rarely listed as the reason for operators' or other people's failures. Let us therefore consider some imaginary but plausible scenarios to see if it is a cause we ought to bear in mind.

Consider an operator or foreman who sets out on a routine tour of the plant. There are half a dozen things he wants to look at. When he gets back to the control room he remembers he has only looked at five of them and he can't go out again because there are other, more urgent tasks, to be done now. Of course, when a continuous plant is running smoothly the average workload is small but random events come in clusters and on batch plants the operators are always busy. Operators' tasks are given to them by the plant rather than other people.

Most of the work on human reliability has been carried out on the last in the long line of people who had an opportunity to prevent an accident, including aircraft pilots and train drivers as well as plant operators and maintenance workers. Relatively little has been done on ways of improving the reliability or preventing the errors of those who choose the process, carry out the chemical or mechanical design, accept the design, construct the plant and accept the finished plant. Yet these people are usually able to check their work while it may be too late for the operator who omits to open a valve, or the train driver who passes a red signal, to do so before disaster strikes.

Consider a junior designer who is working on the detail. The plant includes a high pressure remotely operated valve operated by compressed air. There are two air lines, one to open the valve and one to close it, both connected to the air main by hoses. He looks up the company's standard which shows the type of coupling that is to be used for compressed air hoses and just copies it, twice. Perhaps he has a vague feeling, something half remembered, that this might not be wise. He asks a more experienced colleague who says, "Follow the standards and then you can't be blamed." Nevertheless he decides to talk to someone from the plant or the safety department but before he gets a chance to do so his drawing has been approved by a senior designer and sent to the construction contractor. For an account of an accident that could have arisen in this way see my book *What Went Wrong?*, Section 1.1.1.

A similar scenario could involve a senior manager. Let us assume that he agreed not to include in a new design a traditional feature or procedure for which there no longer seemed to be a need. The Executive had agreed with him and the people who would have to implement the change or live with it had accepted it without comment but he had lingering doubts. He had asked for a literature search but had a feeling that it was slipshod. He had suggested asking a consultant for advice but the design team insisted that this would delay the project and that they knew more about the process than any consultant. After the accident it came to light that the missing feature or procedure had been introduced after a similar accident twenty years before. Fortunately the report said that the underlying cause was an organisational failure and the regulator had agreed. ("Organisational failure" is a euphemism for a senior manager's error as organisations have no minds of their own.)

To sum up, I am making two recommendations:

1. We should consider lack of time as a significant cause of errors of omission, including checking of what we or others have done. The lack of time may occur because we over estimate our own abilities or because we are given more to do than we can manage in the time available. We may be given the extra work by our bosses or clients but also by a normally well-behaved plant which has a bad day.

**2.** We should be more introspective and look at our own errors as well as those of other people. Remember that we judge ourselves by our principles and intentions but others judge us by our actions. We aim to be helpful and reliable; most of the time we are, but others may remember us as the guy that didn't deliver.

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