



University of HUDDERSFIELD

University of Huddersfield Repository

Canter, David V.

Changing Safety Culture in a Steel Works

Original Citation

Canter, David V. (1996) Changing Safety Culture in a Steel Works. In: Psychology in Action. Dartmouth Benchmark Series . Dartmouth Publishing Company, Hantshire, UK, pp. 231-238. ISBN 1855213656

This version is available at <http://eprints.hud.ac.uk/9231/>

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: E.mailbox@hud.ac.uk.

<http://eprints.hud.ac.uk/>

10 Changing Safety Culture in a Steel Works

Background

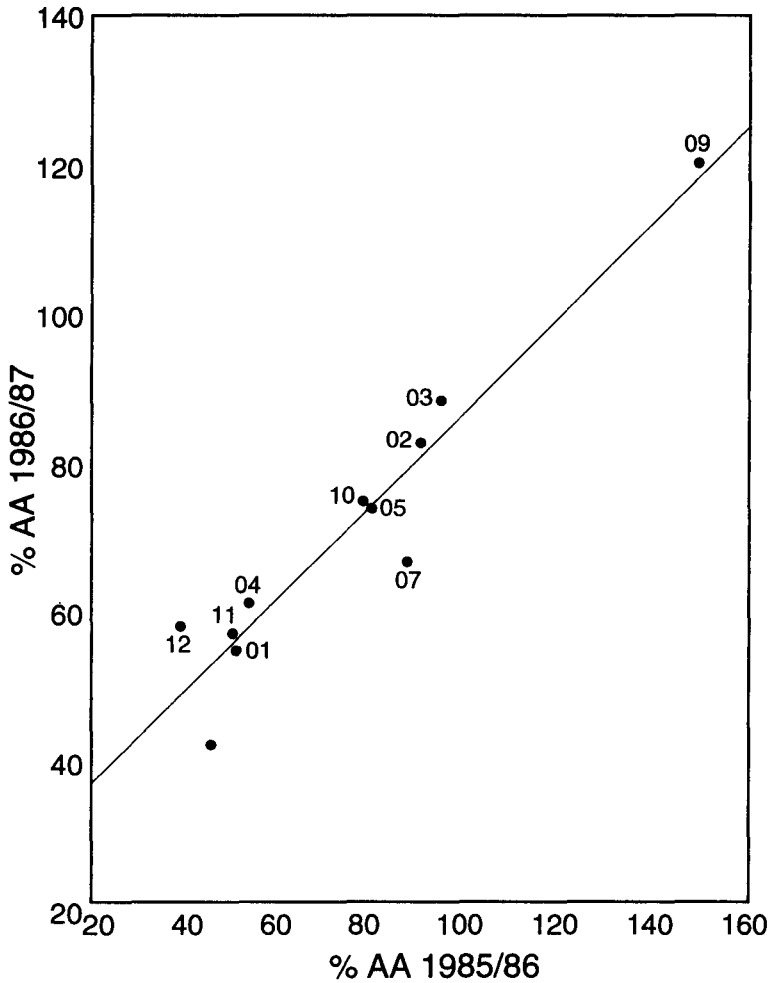
By the mid 1980s the Fires Research Station that funded my studies of human behaviour in fires decided that it had provided what was needed and that they should not support me to do any further research. So I set about finding other ways of developing that work. An opportunity was provided by the Insurance Technical Bureau who wanted to measure the management contribution to risk in industrial processes (Powell and Canter, 1985). This work did not survive the demise of that bureau but it did open the door to British Steel, who were interested in ways of assessing and ultimately improving the attitude of their workforce to safety.

Like many well managed British Industries, British Steel had been able to reduce accidents considerably over a number of years by technical modifications and the introduction of many safe working practices, but they had reached a point where there were still a number of accidents that were impervious to these processes. They were therefore looking for a radically different way to tackle their problems. My colleague Henryk Olearnik and I approached this issue with a series of studies over two years. Some key findings will illustrate how that research unfolded.

The first finding is illustrated in *Figure 1*. This shows correlations between one year and the next for the accident figures for twelve different departments. As can be seen there is a remarkable consistency in the probability of these supposedly *accidental* events. By comparing the figures with expert opinions of the inherent dangerousness of the processes in each department it was clear that these technical variations were not a major cause of the variations in the accident figures. Something in the 'climate' or 'culture' of the department was probably of more significance.

To test this hypothesis attitude to safety scales were developed and the average score on these scales for each department was correlated with their annual safety figures. *Figure 2* shows one of the remarkably strong correlations that were consistently found between attitudes and safety performance.

These very high correlations, that get close to the reliability levels of both the attitudinal and the safety measures, have since been repeated many times over in many different industrial settings. However, of more significance was the particular pattern of correlations with different aspects of attitudes and the distribution of attitude scores or every particular department. For it was these safety climate

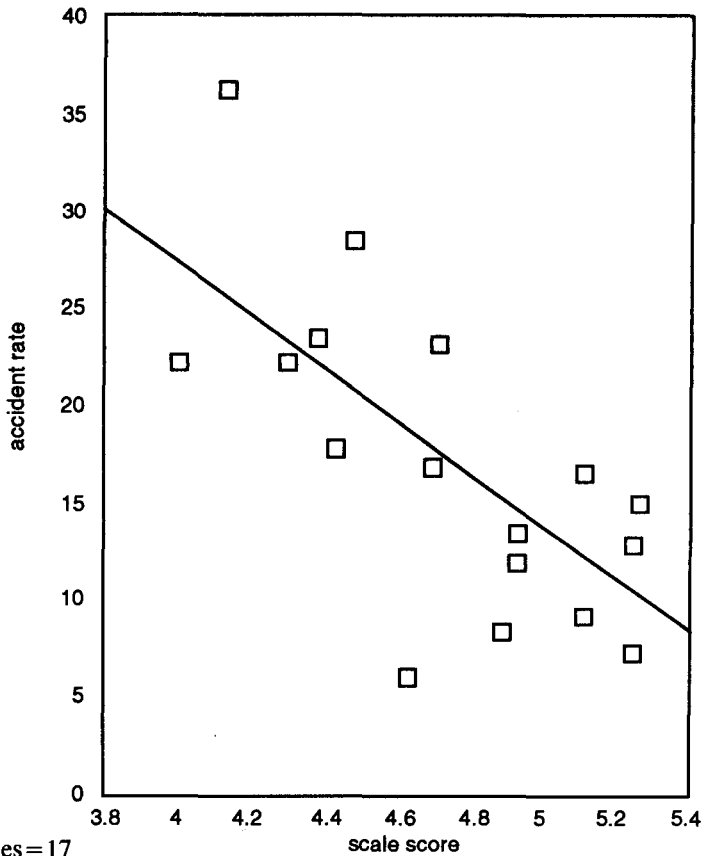


$r=0.91$

Figure 1 Correlation: all accidents 1985/86 x 1986/87

profiles that provided clear directions in which management needed to proceed in order to improve the climate for each department.

A general framework, however, in the form of an action plan was needed to turn these rather academic ideas into something that could be implemented. The following chapter is a copy of the first few pages of that plan. These pages appear to have become almost a sacred text at the Teesside works where the research was done and together with the detailed recommendations and the departmental attitudinal profiles became a framework that was acted upon in great detail. The resulting change accident rates surprised all of us. An example for one potentially



companies = 17
 sample n = 971

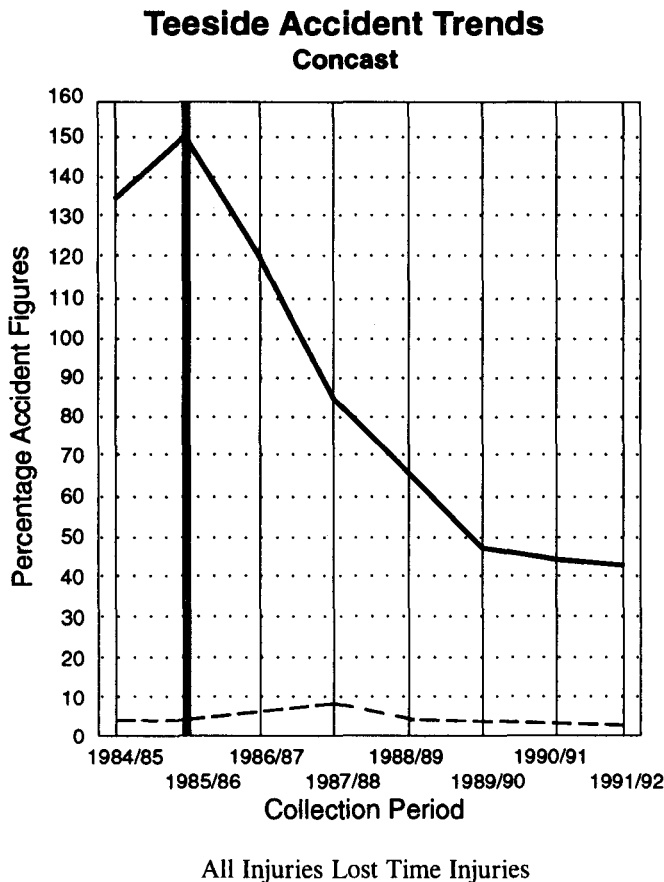
Pearson's correlation coefficient = 0.09**
 ** = p < 0.01 (one-tailed test)

Figure 2 Safety attitude scale 6: shopfloor satisfaction correlation with self reported accidents

very dangerous department is given in Figure 3. Indeed in some departments the target of zero lost time accidents within five years was reached within the first year of the application of the proposals. Since that time a number of other organisations have supported similar research with good results, although none have been quite so dramatic as those achieved at British Steel.

The work at British Steel was greatly assisted by the one person who could have been most threatened by it, their safety manager Peter Jamieson. Undoubtedly his dedication and expertise contributed tremendously to the success of the whole project. The wholehearted support given by the Managing Director of the site,

Danny Ward, was also a crucial factor in its success.



The bold vertical line indicates the point in time at which the Action Plan was introduced.

Figure 3 Teesside accident trends

The zero objective

At present the accident figures at Teesside are much better than some years ago, but there is considerable room for improvement. Recommendations are made with the intention of creating a situation in which there are no accidents within five years.

This report summarises the results of the background research. They show clearly

that there are consistent safety performance differences between plants at Teesside and that these can be related directly to differences in attitudes.

From the research conducted at Teesside and other relevant studies, five principles are presented as a basis for an action plan.

A ten point plan is then proposed that will lead to a change of attitudes and the consequent elimination of accidents. Detailed guidance on how these actions may be taken most successfully is provided.

Five basic principles

To change attitudes enough to eliminate accidents five broad principles should be followed:

- a. Encouragement of safe working practices to be as strong as the discouragement of dangerous working.
- b. Provision of strong support for plant level planning and accountability for safety.
- c. Emphasis on the significance of first line supervisor foremen/supervisors in maintaining safe practices and the development of more appropriate training and monitoring for them.
- d. Utilise social processes as the means of changing attitudes to support the exhortation of individuals.
- e. Emphasise the maintenance and fostering of a good organisational climate for safety.

A ten point plan

The principles can be turned into detailed actions following a ten point plan:

1. Continuously demonstrate commitment to positive safety.
2. Focus safety accountability.
3. Derive plant level initiatives
4. Strengthen work of the safety committees.
5. Rehabilitate lapsed safe working procedures of production as well as engineering.
6. Improve contribution of safety representatives.
7. Develop safety training to emphasise human factors.
8. Regularly and overtly, monitor attitudes to safety and their relationship to safety performance at plant level.
9. Establish procedures to check on and improve safety related communication between all groups.
10. Elaborate and clarify the safety responsibilities inherent in all job descriptions.

An achievable objective

At present there are a great number of separate initiatives that are taken throughout the Teesside works with regard to safety. The effectiveness of these has been clearly demonstrated by the steady fall in the accident ratios over the past decade. However, it is also clear that these actions are no longer very effective in having a major impact on further improvement in the safety record. In broad terms they now appear to be maintaining it at its present level.

A responsive organisation

A number of factors point to the possibility of achieving better safety performance.

One is the fact that earlier measures have been effective so that the organisation as a whole clearly can respond to safety initiatives.

The second is that the attitudinal survey carried out shows widespread support for improved safety, in principle, at all levels of the organisation. Particularly important is the fact that senior management are obviously genuine in their commitment to improving safety performance.

A third is that the research indicates that the very process of surveying attitudes may have modified them and relevant behaviour, supporting the view that a more direct process could have more significant effects.

An overall strategy

A third factor that makes a considerable reduction in accidents an achievable objective is that current safety activities do not appear to benefit from being guided by an overall, detailed strategy. They appear to have grown up in response to many different issues and initiatives. It therefore seems highly likely that if these can be developed into a coherent set of actions that follow an overall strategy for safety at Teesside a real improvement is possible. By taking into account what is now known about the attitudinal basis of dangerous activities a dramatic improvement is possible.

The factors indicating the possibility for improvement all point to the feasibility of eliminating accidents at Teesside.

There is evidence that nearly all accidents are now a product of inappropriate human behaviour at some recognisable stage in the events leading up to the accident. Given that there are many indications that the actions of the work force can be modified at Teesside there are strong reasons to believe that behaviour of relevance to accidents can also be modified.

A clear objective

Making the elimination of accidents the overt objective of the overall strategy also gives it a very clear direction. At the same time it presents as clearly as possible the commitment of British Steel to safe working.

Human factors not technical factors

Workers at Teesside are proud of their skills and the achievements of their industry. They enjoy the technical challenges that their work presents and thrive on debates about processes and products. Within this framework consideration of human aspects of the work situation has tended to be rather limited and mechanical. There is therefore considerable opportunity for developing a more subtle approach to the human factors in regard to safety.

Personal contact

Many years of research on attitude change show that the strongest change processes come from direct contact between people within the context of group support. It is clear that there is considerable opportunity for strengthening these processes at Teesside.

Preservation not compensation

The research indicates that accidents are generally thought of in terms of their threat to the individual. There is also no evidence from our research that anyone considers possible compensation claims as a reason for taking risks. The enhancement of the awareness of the workforce of how they can reduce risks is therefore likely to fall on fertile ground.

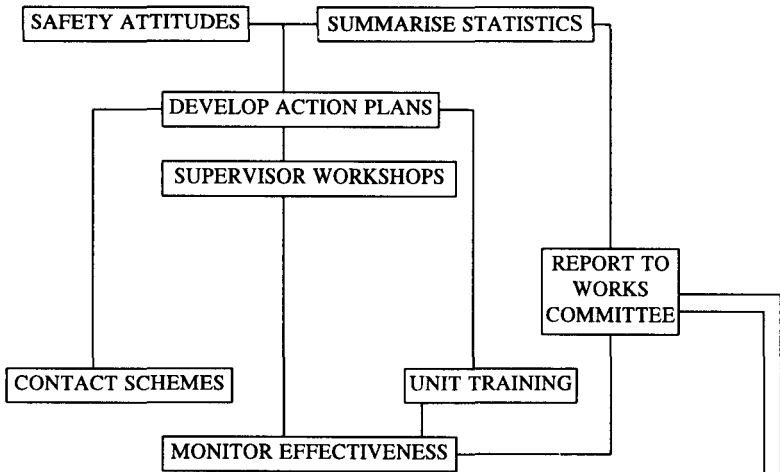
Beyond protection to procedures

A further reason why the zero objective is feasible is that the research has revealed that, in general, the wearing of protective clothing is now well established at Teesside. The correlates of accident ratios are attitudes to safety procedures. So, by giving more emphasis to active safe working, improvements in behaviour are possible beyond those achievable by emphasising the more passive response of just wearing protective clothing and using safety equipment.

No magic formula

It must be emphasised that attitudes and consequent behaviour cannot be changed by isolated actions, such as a poster campaign or beefing up training. Behavioural change is brought about by a number of interrelated actions that form a coherent plan. The more these actions can build upon current, worthwhile activities the more chance they have of success.

SCHEMATIC REPRESENTATION OF ACTIONS TO BE TAKEN WITHIN PLANTS FOR ELIMINATING ACCIDENTS



A SCHEMATIC REPRESENTATION OF THE OVERALL STRATEGY FOR FACILITATING THE ELIMINATION OF ACCIDENTS

