



Behavioural Goal-Setting on Construction Sites

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Safety practitioners in the construction industry are recognised as having a particularly difficult job. Because construction has a poor record on safety, a research project was undertaken by UMIST university to see whether a behavioural approach to safety could be useful to the industry and what, if any, adaptations would be needed to apply it effectively.

Dr. Tim Marsh details the practical difficulties experienced in a project to implement a behavioural approach to safety on UK construction sites.

A great deal of research has shown the efficiency of a behaviour based approach to safety in production processes and high hazard industries. In the Building Engineering Department of UMIST it was decided to see whether the approach could be adapted to be of benefit in the construction industry. A research project was set up in two phases; the first to find out if the behaviour-based approach could effectively improve safety behaviour on site and second to see what practical difficulties were involved in implementing it.

In the second phase, 26 construction sites varying from civil engineering to building and from small (15 workers) to large (200) were assessed. On each site a percentage measure of unsafe behaviour was taken over a period of weeks as a baseline. Participative goal setting sessions were then held with workers and targets for improved safety behaviour were agreed. Performance was monitored and fed back to workers on a weekly basis by means of graphic and narrative feedback charts - split into categories: housekeeping, scaffolding, access to heights, Personal Protective Equipment (PPE) and (on civil sites) plant. Participative sessions to review performance were held at regular intervals.

Phase Two Results

Seven of the sites folded before meaningful scores were collected; one showed a non-significant increase in safe behaviour. Figure one summarises the mean results to date aggregated across all 19 'completed' sites.

These results therefore appear to add to the findings of Kamaki (1) and Mattila and Hyodynmaa (2) in suggesting that the use of goal setting and feedback techniques can significantly improve safety behaviour on building sites - even when implemented by organisations themselves. They contrast with the minimal effects that previous research has recorded for other interventions such as information safety campaigns and safety training. (3)

The findings were that goal setting and feedback do not appear to work as theory suggests - at least not on UK construction sites. Both qualitative and quantitative evidence suggests that operatives were not consciously striving to achieve goals. Very few knew what current levels of performance or goals actually were - though, typically, all knew of the intervention and had reasonably accurate 'global' impression of the scores. (It will not surprise readers to learn that specific knowledge of scores increased substantially when performance was linked to a cash incentive).

It appears that, generally, the intervention works through increasing awareness of safety issues and increasing and improving communication between management and the work force. In addition, once baseline levels are set and displayed in a public place, management will be extremely reluctant to let scores drop, effectively setting a minimum level of safety behaviour. Specific difficulties encountered included the following:

Management Commitment

As expected, the role of management commitment appears vitally important - as it is for all organisational interventions. (4)

Managers seemed to fall into two distinct types. The first type of manager, the 'fire-fighter', will not tolerate safety standards falling below a certain (often very high) level. This manager will react strongly when standards fall too far ('heads roll') but will pay little direct attention to safety if standards are adequate. The second type of manager will pay more attention to the increased information generated by goal setting sessions and the increased awareness of safety issues.

Training

After a half-day's formal training and half-day's on-site training, the great majority of observers expressed themselves 'fully prepared' to implement the interventions. When UMIST personnel visited sites during the baseline observation period however, each visit typically needed to contain a training element, concerning either the definition of safe and unsafe behaviour; the use of the measure; or scoring of the measure. This suggests that organisations implementing intervention without the back up of the research team will need to develop rigorous training systems and detailed procedures in document form. Work is currently being undertaken on a stand-alone training package which may help with this.

The Observers

Not surprisingly, the role of the observer is vitally important. Two factors seem to be key: first, the disposition of the observer; second, the position within the organisation that the observer occupies. It appears to help the observers if they have a good rapport with the workers. Regardless of the widespread increase in safety consciousness - a certain cynicism prevails on sites and observers will frequently have to defend 'this rubbish' to workers and managers. (Some workers are wary that the system is a 'management trick' designed to put responsibility for safety onto workers alone). The need for a good rapport is also noticeable during the initial goal setting session where observers have shown wide variation in their ability to generate meaningful discussion on the safety initiative.

Organisational position

Typically, on sites where management are not fully committed, supervisors are not clearly instructed to allow their staff the time to take measures and observers quickly begin to make only the very minimum number of observations. Accordingly, the freedom to vary the time when the measure is taken becomes diminished - with observers taking measures only towards the end of the week. In all instances where management commitment was low and the observer less than conscientious - maintaining a methodologically rigorous approach was found to be difficult (if not impossible).

A different problem occurs where management are sensitive to scores, and try to prevent bad scores from being posted. This has been observed from managers who are uncommitted to the intervention and simply do not want to 'look bad' and from highly committed management who 'don't want to demoralise the workers with bad scores'. At this point, observers' disposition and relationship with management combined - only confident and positionally secure individuals defied their managers.

A further complication occurred where the intervention was so well accepted by site personnel that observers became a very fruitful source of communication between operatives and management and non safety issues were often raised. Even enlightened management are not going to be able to address all issues raised - and some observers became frustrated and militant. One who took it upon himself to become almost an unofficial union representative, found himself caught between the demands of the men and management practicalities and became very discouraged and agitated. No one on site believed that his unexpected transfer to a new site was coincidental - cynicism among operatives on this site now abounds. The crucial point is that if systems are not in place to deal effectively with what can be a vastly increased amount of feedback between management and workers - the intervention can become a victim of its own success.

Number of observers

Ideally, at least two fully trained observers are required on each site. These observers should share the work, rather than one being a 'back-up' for times when the main observer is unavailable. In addition, since junior management can be transferred to another site with notice of only two or three days (as several of the observers were in the project) - it is important to have an experienced and committed observer who can 'hold the fort' while a replacement is trained. Working with another observer as a team and with the back-up of supportive management also appears to help minimise any sense of isolation.

'Champion' of intervention

The research suggested that a central figure (other than a researcher) is needed to be the driving force behind the implementation of this approach. On some sites a dynamic or committed observer may take on this role. This may be because of a deep rooted commitment to safety, conscientiousness, or because of a professional ambition that will be served by running a project well. Alternatively, it may be site intervention success that provides the necessary drive and energy.

Goal-setting and review sessions

The timing and location of goal-setting sessions need careful consideration. Asking men to turn up during breaks usually proves problematic. If workers do turn up at all (or are forced to) - they are very likely to prove an unsympathetic audience. In addition, insisting that workers hold goal-setting sessions in their own time is also highly likely to reflect a lack of management commitment in general.

Where there are too many workers on site for one session, management need to ensure that all noisy work in the surrounding area is halted. If this is not done, there can be serious problems hearing what is being said and the workers may talk among themselves - creating a poor environment. An important consequence of a 'poor' goal-setting session, where discussion is limited, is that the goal is unlikely to be set, or seen to be set, in a participative fashion. While the generation of true 'psychological ownership' of the goals is debatable regardless of the format of the goal-setting session (see above) - it is essential that the principle of consultation and two way feedback is clearly established.

Ideally, management should be present at these sessions. As well as providing a visual display of their commitment to the intervention, managers are nearly always called upon to deal with various side issues that occur. It is normally difficult to get workers to talk - and when they do, they tend to complain - usually about such matters as toilet and drying facilities, rather than about central safety issues. As one memorably put it; "If the state of that canteen isn't a health risk I don't know what is. I tell you, the men won't use it and they're eating their sandwiches on the roof - I slipped on an old apple core the other day and nearly fell off".

The most successful sessions were held on sites where each review session started by addressing the issues raised at the previous sessions. Workers proved realistic. When a facilitator said, 'we've done X but simply can't afford to do Y' workers usually accepted this, pleased their concerns were given due consideration - if due consideration was given - rather than resentful that they had not been granted their wish.

Even when operatives do discuss safety issues it is often to blame other trades. Having someone with sufficient process skills to intervene and make a contribution that gets the discussion focused on the right track helps the observer keep to the topic and keep the discussion positive.

Variations between sites

The changing nature of work on construction sites can complicate goal-setting. On some sites, for example, the number of operatives using scaffolding may increase after the baseline is set - making a simple maintenance of baseline scores a satisfactory goal. Such factors may be accounted for during goal-setting.

New categories and items

On the civil engineering sites where a lot of heavy machinery is used, a 'plant' category was developed. This category addressed items such as the speed of trucks and the use of banks men. In addition, some new items were added to existing categories. For example, the wearing of reflective vests is compulsory (and necessary) on such sites, so this was included in the PPE category. Importantly, changes such as these helped increase the face validity of the measure with site personnel.

Subcontractors and the safety vs. productivity trade off

Using subcontractors may be cheap and convenient but causes problems - especially since remuneration tends to be directly linked to speed of completion. The term 'experienced labourer' can turn out to mean that they have spent two weeks labouring on a farm and have never been on a building site before. An illustration of the problem is the fact that site personnel in general are far more likely to be injured in their first few days on an unfamiliar site - regardless of previous site experience. (5)

Worse, the conditions of work and the wages they are paid makes the likelihood of subcontractor workers taking the job seriously minimal. (6)

Adam's 'equity theory' (7) suggests workers will intuitively calculate what constitutes a 'fair' degree of effort, such workers may be largely indifferent to appeals to show discipline and personal responsibility - even though it is in their best interests to do so. In addition, subcontractors are not often on site long enough to develop any great interest in intervention - even if they should happen to be present at a goal-setting or review session. Quite simply, it was found that present work practices make the implementation of any type of safety intervention more difficult.

More positively, however, safety intervention can have some impact on workers who care nothing about management goals. Individuals will only work as unsafely as they personally feel comfortable with and they can get away with. The former can be influenced by increasing safety awareness generally and the latter by improving site safety culture - both of which appear to be improved by intervention. As one worker said, "When you first get on site you do look around to see what's what".

Workers are generally too busy or apathetic to seek out the charts - so they need to be unavoidable. This may mean using several charts - for example, at each of the time clocks. This ensures that workers are reminded of the intervention and the fact that their safety performance is being monitored on a daily basis.

Several additions to the basic feedback chart have also been introduced and have been positively received by observers and workers. A summary of the methodology of the intervention and the items covered by each category of measurement was placed next to the feedback chart. This has the advantage of informing new members of the site what the intervention is about (especially that it focuses on specific behaviours not accidents) - as well as reminding original operatives of the details. In practise, this may actually mean informing them for the first time if they missed the goal-setting session, were present but unable to hear clearly, or were present but simply not paying attention. Other sites have, in addition, circulated loose copies of this sheet in canteens.

"Narrative charts" have also proved popular. These charts (usually 297x420mm) are divided into the relevant categories. On them observers can write brief comments such as 'scaffolding pretty good except block C4 - which was very poor'. The main advantage of these charts is that they help counter the 'these scores are rubbish, I haven't seen anything wrong in my block' criticisms by reminding operatives that scores refer to the whole site.

The majority of workers interviewed about the intervention said they would like more oral feedback. On one small site the observer (who was also the site manager) would make a point of discussing scores with everyone in the canteen on Friday lunchtimes. (In effect a weekly review session). Nearly all the workers were full time employees with the company. The dynamics of this site could not have been better - and all three categories employed on this site showed significant increase from baselines of around 90 per cent. (In addition, there was not one lost time accident in over 13,000 working hours and the contract was completed in only 70 per cent of the budgeted time).

Summary and conclusions

It is apparent that there are many practical problems that may hinder the effectiveness of a safety intervention. The attitude of management is central. If it is poor, the intervention will almost certainly struggle as the will to address the more practical issues will be missing. Given management commitment, however, behavioural goal-setting and feedback proves an effective management tool for increasing building site safety.

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