

## **The Implementation of Effective Key Performance Indicators for Major Hazard Enterprises**

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The UK Health and Safety Executive (HSE) considers that the development and adoption of Key Performance Indicators (KPIs) using both leading and lagging indicators to measure and monitor the effectiveness of major hazard risks is an essential part of an organisation's management arrangements. These indicators are separate to, and distinct from, measures of personal safety such as lost time incident rates as the focus has to be on major hazard risk. Successful management of major hazard risks and success in business cannot be separated.

Effective KPIs should be considered the 'currency' of risk management. Decisions made throughout an organisation relating to the management of major hazard risks, and especially decisions made by senior executives, need to be made in the light of sound information on the current status of risk and risk controls within that organisation.

KPIs for major hazard risks are necessary because systems of risk control and measures in place to prevent a major accident will deteriorate over time, sometimes without and apparent prior warning. Senior managers tend to have an over-optimistic view of the robustness of the systems and arrangements in place to prevent a major accident and are often unsighted to the erosion and deterioration in those systems. Senior executives can become over reliant on technical experts and do not always know how and where to challenge what they are being told. Within some organisations, people tend to be rewarded only for reporting 'good news' on performance and are often praised and rewarded for finding 'work arounds' for problems and difficulties that may actually compromise safe operations but against which they may not be competent to judge their actions.

HSE's experience of the barriers that prevent the effective implementation of KPIs for major hazard risks stem from:

- a poor understanding of the issues,
- an absence of effective leadership within organisations to drive forward KPI programmes,
- seeking a quick solution or a simplistic measure of major hazard risk, and
- failure to pay proper attention to the prevailing culture within an organisation ahead of the implementation of a KPI programme.

There is a need to better understand the relationship between sector or industry-based KPIs, indicators that are set for a whole organisation, and those which operate at a site or facility level. In all cases there is not 'a one size fits all' solution. At each level indicators have to be tailored to the specific risks present. Therefore, sector or industry based indicators will, by their nature, be generic and less focused on prevailing risks when compared to organisational-based indicators.

The core principle in a KPI programme is to ensure that information is collected against the most critical aspects of risk control present within an organisation. This requires a shared understanding of which aspects of risk control are the most critical or important. For complex processes and organisations this is not straightforward and needs a high degree of engagement across an organisation. Additionally, to stay really focused, process safety KPIs also need to target those aspects of risk control

that are most vulnerable to deterioration or which represent last lines of defence against a major accident.

In major hazard KPI programmes there is often insufficient attention to the customer for the results and outcomes of measuring risk. The first customer for a KPI programme has to be those directly involved in hazardous work. They have to be able to quickly understand and act on the findings and make adjustments to the way risk is managed especially where the KPI shows a deviation from an expected way of working or performance. It is therefore essential that front line staff are involved in the establishment of a KPI programme so that there is shared ownership. The second customer is those responsible for the risk management programme and who are able to make the medium and long-term decisions on change and improvement. This is the management team and Board of Directors. Finally, external stakeholders have a legitimate interest. These include governments and society who require assurance that major hazard risks are being effectively managed because they can be directly or indirectly affected by a major accident and often have to pick up the costs associated with, for example, clean up, remediation and caring for the sick and injured in the aftermath of a major accident.

So the critical characteristics of effective KPIs are that they:

- reflect a consensus of those aspects of managing risk that are essential to preventing a major accident,
- are tailored to the specific risks that are present within the business,
- focus on vulnerability and provide opportunity for early intervention,
- are based on data already available and collected within an organisation, and
- are clearly defined in terms of what they are measuring and why that issue is important.

### **Leading versus Lagging?**

Properly focused lagging indicators provide an undisputable opportunity to learn about what went wrong and why, and improve before a repeat and possibly a more extreme incident occurs. However, the learning is always after the event and therefore, in one sense, too late. Leading indicators provide a much greater opportunity for prevention ahead of an accident. There is need for greater understanding on the concept of a leading indicator in that many organisations consider a small scale accident or one with no adverse consequences to be a leading indicator. For instance, a loss of containment of highly flammable liquid that does not ignite and does not cause damage or injury is often considered as a leading indicator whereas in fact the incident is a failure to control risk and the actual consequences is often a feature of chance.

Even where leading indicators are linked to assurance that the control measure in place actually operates as intended some leading indicators focus on measures quite far removed from the actual control of risk. An example of this is measuring the number of outstanding audit actions within an audit programme rather than measuring where process controls that ensure containment of hazardous substances has been compromised.

Moreover, targeted KPIs are also good for business by alerting an organisation to deterioration in plant, processes and procedures essential to the effective continuation of operations. Good KPI programmes can demonstrate to stakeholders, investors and insurance agencies that risks are being effectively managed and the risk of catastrophic failure mitigated.

## **Indicators driving performance**

The most important feature of a KPI is that it provides valuable information on the status of an essential control measure but what really counts is the action taken on the basis of that intelligence.

Organisations that collectively identify and agree on critical control measures vital for the prevention of a major accident will directly share a common view on the importance of the data that KPIs provide. The findings from a KPI programme will provide a collective view of where strengths and weakness lie in the management of risk. This will minimise any discussion around the meaning and value of the outcome and help focus improvements where weaknesses are discovered.

### **Are Indicators Predictive of a Major Accident Event?**

KPIs cannot predict a major accident that has not been identified as part of an organisation's risk assessment and against which essential controls have not been established. However, setting KPIs around the key risk controls that guard against a major accident should more readily help identify a potential weakness that may lead to a major accident. Where indicators have been set at a generic or sector level then it becomes much more difficult to ensure indicators predict major accidents.

### **The Statistical Validity of KPIs for Identifying Trends in Performance**

Providing that KPIs are clearly defined and measured in a consistent manner then they can provide a powerful model for monitoring trends and variations in performance. This will be relevant at organisation sector or industry level. However, before undertaking trending it is always important to establish the aim, the desirable level of performance, and the desired outcome against which the trending is undertaken.

### **The Role of the Regulator**

The essential role of the regulator for major hazards is to provide public assurance that those whose activities give rise to risks to people and the environment are adequately controlling those risks. Industry in turn should ensure that there is transparency and openness in how well those risks are being controlled. KPIs are an essential ingredient in that dialogue between the Regulator and the regulated in, for example, setting and agreeing programmes for operators' major hazard improvement and the regulator's intervention strategies and plans.