



SAFETY, HEALTH AND ENVIRONMENTAL MANAGEMENT

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There is a global trend towards improved performance in engineering regarding Safety, Health, and the Environment. Safety is becoming increasingly important not only during construction, but for designers to consider safety in their design for the whole project life, from materials selection, through construction, to operation, and eventually decommissioning and demolition. Similarly, engineers are looking at the environmental impacts of their projects through these same stages, and this work is set to increase as awareness of sustainability increases.

SKM has recently achieved a milestone of 4 years and 3,000,000 hours worked without Lost Time Injury (LTI) as consultants to ExxonMobil affiliates for their Asia Pacific Retail Construction Program across 8 countries. SKM provides Project Management, Design, Permitting, and Construction Management for multiple sites in Malaysia, Hong Kong, Singapore, Australia, New Zealand, Guam, Thailand and New Caledonia through an Outsourcing Service Provider contract. This achievement has been the result of an approach that can be similarly applied to most aspects of engineering management, whether it be Safety, the Environment, or Quality Assurance.

The start of any effective approach is a corporate philosophy that is aligned to the outcome. For consulting engineers this requires an alignment of the philosophies of both client and consultant. The philosophy is not a policy in a frame or an office wall, it includes senior management support and continual significant actions by management that reinforces that safety is important and needs investment to be managed.

SKM has a SH&E policy similar to many companies, but our philosophy is "Zero Harm". ExxonMobil affiliates have a similar philosophy that "Nobody Gets Hurt". The primary driver behind these philosophies is a sincere concern for the wellbeing of people. Additional drivers are also strong and varied, and include; the direct and indirect costs associated with injuries; the potential legal risks for managers; reinforcing diligent adherence to company systems; company reputation; and a clear conscience allowing for a sound sleep at night.

Too many companies manage SH&E reactively – after an incident, when it is too late. Learning from the incident should prevent it from happening again, but the incident may have been avoided entirely through better pro-active management taking pre-emptive actions. Investigations seldom identify a cause that was entirely new, and not connected to other factors. Identifying and eliminating root causes from reviews or assessments of "near misses" will prevent a more serious incident when these factors would have previously combined. The adage that "prevention is better than cure" applies to the most effective management systems, and equally to all aspects of engineering.

Senior Management involvement is essential for the success of proactive safety management. "Top Down" reinforces that a company is serious about safety, and is prepared to invest to make sure the best outcomes are achieved. The investment required is time, time to assess the risks of activities and implement risk management to eliminate or control the risks. Time is also required to get every person involved in the process, to understand what is being done and to provide input into the identifying risks. This will include identifying "near misses" and identifying their root causes for inclusion in the risk management plan.

A proactive safety system involves risk assessment on a continual basis. An initial assessment and subsequent management plan will address the risks at that time, but does not manage changes. Working environments change on a regular basis, and on a construction site they change by the minute. Therefore, the risk assessments need to be practiced by every person, every day, for every activity. For office workers this will be very routine, but for construction workers it will involve stopping for a few moments to check the activity, look for changes, and assess the risks before proceeding. The underlying Principles behind a proactive, risk assessment, safety system are therefore;

- 1) Development and communicate the system
- 2) Everyone must participate (top down and bottom up)
- 3) Risk assess and eliminate hazards before acting
- 4) Include risk assessment into daily activities and behaviour

As with any system, however, it is not effective unless it is used continuously and correctly. The system implementation needs to be reviewed frequently and in different ways to test its effectiveness. The reviews and audits also need to be given sufficiently high priority and management support to ensure they take place as and when needed. All too often in the past, system assessments have been postponed due to management allowing an excuse of "too busy" to be accepted.



Reviews in a risk assessment based safety system include:

- Near miss and incident reporting.
- Review of risk assessment and associated management by others in the same team and peers.
- Review of activities against the risk assessed action plan including on-site observations and desktop audits.
- Self assessments of system implementation by individuals and teams.
- Internal (same unit/company) assessments of system implementation.
- External (different unit/company) audit of system implementation.



The frequency of the reviews needs to be in proportion to the frequency of activities and the risk associated with the activity. On-site reviews are an ideal opportunity for high profile involvement by senior management and for peers to share lessons learned from their experiences.

The reviews then need to be analysed to look not only at any gaps identified, but also at the root causes behind the gap. Typical causes behind gaps are due to training or incorrect behaviour. Just as working environments change, so will safety systems as they are reviewed and improved to respond to the assessments. This results in the need for regular refresher training to keep everyone up to date, and to reinforce correct behaviour as everyone is reminded of their individual responsibility.

Human behaviour is probably one of the most difficult aspects to control in any system. The different influences on behaviour include culture, religion, education, and environment at a macro level, and include fatigue, emotions, and instantaneous physical influences at a micro level.

Why does a worker using the same tools and doing similar tasks injure themselves for the first time after 17

years? Training and physical factors were correct but they were in a hurry and so did not behave properly. Continual active reinforcing of correct behaviour is essential for system success whether it is through daily "toolbox talks", weekly team meetings, annual refresher training, or a combination of all of these.

The importance of passive reinforcing of behaviour also needs to be considered as peer behaviour shapes the attitude in any environment. Managers and supervisors need to lead by example and "walk the talk" and recognise when good behaviour is observed. Peers take note of the behaviour of each other and are receptive to positive recognition of behaviour, especially at a site worker level. Being actively involved in reviews of activities will improve their knowledge, safety culture, and the importance of their observations.

Over the last 4 years, SKM has undertaken and been subjected to many and varied reviews of the safety system we have used on the programme. Over 3,000,000 hours has been worked by over 70 contractors spread over 8 countries with varying cultures, education and working environments. This equates to an average of approximately 300 labourers on sites every day, with a peak workforce estimated at 600. Throughout this effort there have been few first aid/minor injuries and zero Lost Time Injuries or fatalities - a noteworthy achievement.

The safety practices behind this result have the following key characteristics:

- A systematic and detailed risk assessment based safety system.
- High profile, continuous and active senior management support from SKM and ExxonMobil affiliates.
- A proactive and preventative behaviour to implement the system.
- Continual and varied reinforcement for the daily application of the system.
- Emphasis on personal responsibility and safe work planning. Frequent and varied reviews of the implementation of the system.
- Continual improvement and training in the use of the system.

SKM has had its initial 4 year contract extended for a further 5 years, partially because the earlier contract was executed safely, and this safe execution is a tangible demonstration of a well run company with robust systems that are well implemented. Senior management from both SKM and ExxonMobil affiliates can take further comfort from the fact that hundreds of workers return home safely each day as they have done for the last 4 years

ABOUT THE AUTHOR

The author is a Senior Associate with Sinclair Knight Merz – Engineers and Project Managers. He has an Honours Structural Engineering Degree from Sydney University in Australia and has over 20 years experience in the design and management of building and infrastructure projects and programmes in Australia, Asia, and the UK. He has been employed by consultants, contractors, and also clients in the delivery of engineering projects.

He is currently Programme Manager for SKM on ExxonMobil affiliates' Asia Pacific Retail Construction Programme and is based in Kuala Lumpur, Malaysia.

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REFERENCES

Dr James Bennett "Loss Prevention System"™