Human error Vs. Work place Management in modern organizations

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Abstract— First of all, we are all humans, and humans aren’t perfect. We often hear that the cause of an accident was “human error.” After investigation, that may be found to be true. But there is a correlation between the workplace environment and the human that is employed there. We know that businesses must comply with government regulations and standards of safety and health for their employees.

It would seem that the starting point of avoiding human error is to establish strong policies and procedures. Beginning with human resources personnel, who pass on valuable information to new employees, and following through with training, management, good communication, and the design of a workplace that leads to safety – are all factors that will ensure that people work successfully.

Keywords- Pension, Economy, Investment, Risk, Return, Portfolio, Equities

I. INTRODUCTION

Failure is an event, never a person’. ~William D. Brown, Welcome Stress! ! !

‘When people start criticizing you or when they start pointing fingers at you, then you can understand that you are going in the right direction. The greatest barrier to success is the fear of failure’.

I can truthfully admit that as a new employee, with early-on training, I still didn’t understand fully about my new job. It takes time and practice to really catch on. Maybe some are faster learners that I was, but I know that when there’s too much information to absorb, it’s easy to make errors. Think about someone who does data entry all day long, and may miss just one digit on the keyboard, causing costly errors. (Remember the computer glitch that caused the Stock Exchange to seemingly tank not too long ago?) Between 70% and 90% of workplace errors are attributed to “human error”, but it may be due to a mismatch between the plan of the systems with which they may be required to work and the way they think and work.

If a company assures their employees that they want an employee to report a mistake they made, in order to ensure safety, without reprimanded, those workers will be more likely to do so. Many times workers are under peer pressure, or demands of their supervisors to complete a job hurriedly; or they may be placed in a work environment that is not conducive to safety. The blame does not fall on the employee under these conditions. For example, if their job requires charting or reading meters, and the lighting isn’t adequate, whose fault is it when the readings are incorrect?

Companies must have a strong safety committee that enforces compliance with safety rules. If employees know that part of their job evaluation is based on their compliance with safety rules and wearing the Personal Protective Equipment they are required to wear, they may be more vigilant to avoid making mistakes. Continued safety training and repeated training is important to the success of any employer. Another key to good safety practice is to have some type of reward for employees who recognize and report a potential hazard. If employers could rotate the repetitive and boring types of responsibilities among several persons, by giving them different tasks, a safer workplace could be established. Posters always play a valuable role in reminding workers to stay alert.

As stated earlier, there will always be “human errors.” Some of those errors have proved to be very devastating to individuals and families, such as airline crashes or medical errors. These are usually the ones that are reported to the public. But small mistakes or big ones will continue being made. Every single person needs to be more aware of the
Human factors refer to environmental, organisational and job factors, and human and individual characteristics, which influence behaviour at work in a way which can affect health and safety

This definition includes three interrelated aspects that must be considered: the job, the individual and the organisation:

**The job**: including areas such as the nature of the task, workload, the working environment, the design of displays and controls, and the role of procedures. Tasks should be designed in accordance with ergonomic principles to take account of both human limitations and strengths. This includes matching the job to the physical and the mental strengths and limitations of people. Mental aspects would include perceptual, attentional and decision making requirements.

**The individual**: including his/her competence, skills, personality, attitude, and risk perception. Individual characteristics influence behaviour in complex ways. Some characteristics such as personality are fixed; others such as skills and attitudes may be changed or enhanced.

**The organisation**: including work patterns, the culture of the workplace, resources, communications, leadership and so on. Such factors are often overlooked during the design of jobs but have a significant influence on individual and group behaviour.

In other words, human factors are concerned with what people are being asked to do (the task and its characteristics), who is doing it (the individual and their competence) and where they are working (the organisation and its attributes), all of which are influenced by the wider societal concern, both local and national.

Human factors interventions will not be effective if they consider these aspects in isolation. The scope of what we mean by human factors includes organisational systems and is considerably broader than traditional views of human factors/ergonomics. Human factors can, and should, be included within a good safety management system and so can be examined in a similar way to any other risk control system.

II. CATEGORISING HUMAN FAILURE

It is important to remember that human failures are not random; there are patterns to them. It is worth knowing about the different failure types because they have different causes and influencing factors and as a consequence the ways of preventing or reducing the failures are similarly different.

There are two types of human failures (unsafe acts) that may lead to major accidents:

A. Unintentional errors

Errors (slips/lapses) are “actions that were not as planned” (unintended actions). These can occur during a familiar task e.g. omissions like forgetting to do something, which are particularly relevant to repair, maintenance, calibration or testing. These are unlikely to be eliminated by training and need to be designed out.

Mistakes are also errors, but errors of judgement or decision-making (“intended actions are wrong”) - where we do the wrong thing believing it to be right. These can appear in situations where behaviour is based on remembered rules or familiar procedures or unfamiliar situations where decisions are formed from first principles and lead to misdiagnoses or miscalculations. Training is the key to avoiding mistakes.

B. Intentional errors

Violations differ from the above in that they are intentional (but usually well-meaning) failures, such as taking a short-cut or non-compliance with procedures e.g. deliberate deviations from the rules or procedures. They are rarely willful (e.g. sabotage) and usually result from an intention to get the job done despite the consequences. Violations may be situational, routine, exceptional or malicious as outlined below.

**Routine violations**: a behaviour in opposition to a rule, procedure, or instruction that has become the normal way of behaving within the person’s peer/work group.

**Exceptional violations**: these violations are rare and happen only in unusual and particular circumstances, often when something goes wrong in unpredictable circumstances e.g. during an emergency situation.

**Situational violations**: these violations occur as a result of factors dictated by the worker’s immediate work space or environment (physical or organisational).

**Acts of sabotage**: these are self-explanatory although the causes are complex - ranging from vandalism by a demotivated employee to terrorism.

There are several ways to manage violations, including taking steps to increase their detection, ensuring that rules and procedures are relevant/practical and explaining the rationale behind certain rules. Involving the workforce in drawing up rules increases their acceptance. Getting to the root cause of any violation is the key to understanding and hence preventing the violation.

III. FACTOR INFLUENCING HUMAN BEHAVIOUR

In order to address human factors in workplace safety settings, peoples’ capabilities and limitations must first be understood. The modern working environment is very different to the settings that humans have evolved to deal with. The following human characteristics that can lead to difficulties interacting with the working environment.

Attention - The modern workplace can 'overload' human attention with enormous amounts of information, far in excess of that encountered in the natural world. The way in which we learn information can help reduce demands on our attention, but can sometimes create further problems.

Perception - In order to interact safely with the world, we must correctly perceive it and the dangers it holds. Work environments often challenge human perception systems and information can be misinterpreted.
Memory - Our capacity for remembering things and the methods we impose upon ourselves to access information often put undue pressure on us. Increasing knowledge about a subject or process allows us to retain more information relating to it.

Logical reasoning - Failures in reasoning and decision making can have severe implications for complex systems such as chemical plants, and for tasks like maintenance and planning.

Environmental, organisational and job factors, in brief, influence the behaviour at work in a way which can affect health and safety. A simple way to view human factors is to think about three aspects: the individual, the job and the organisation and their impact on people's health and safety-related behaviour.

Following figures shows that all three are interlinked and have mutual influence

Individual factors
- Low skill and competence level
- Tired staff
- Bored or disheartened staff
- Individual medical problems

Job factors
- Illogical design of equipment and instruments
- Constant disturbances and interruptions
- Missing or unclear instructions
- Poorly maintained equipment
- High workload
- Noisy and unpleasant working conditions

Organisation and management factors
- Poor work planning, leading to high work pressure
- Poor SOPs
- Lack of safety systems and barriers
- Inadequate responses to previous incident
- Management based on one-way communications
- Deficient co-ordination and responsibilities
- Poor management of health and safety
- Poor health and safety culture.

It is concluded that the performance of human is being strongly influenced by organizational, regulatory, cultural and environmental factors affecting the workplace.

For example, organizational processes constitute the breeding grounds for many predictable human errors, including inadequate communication facilities, ambiguous procedures, unsatisfactory scheduling, insufficient resources, and unrealistic budgeting in fact, all processes that the organization can control.

Following figure summarizes some of the factors contributing to human errors and to accidents

The typical examples of immediate causes and contributing factors for human failures are given below:
IV. MANAGING HUMAN FAILURES: COMMON PITFALLS

There is more to managing human failure in complex systems than simply considering the actions of individual operators. However, there is obvious merit in managing the performance of the personnel who play an important role in preventing and controlling major incidents, as long as the context in which this behaviour occurs is also considered.

There are several mistakes that major hazard sites commonly make when assessing human performance. These include:

- Treating operators as if they are superhuman, able to intervene heroically in emergencies
- Providing precise probabilities of human failure (usually indicating very low chance of failure) without documenting assumptions/data sources,
- Assuming that an operator will always be present, detect a problem and immediately take appropriate action,
- Assuming that people will always follow procedures,
- Stating that operators are well-trained, when it is not clear how the training provided relates to major accident hazard prevention or control and without understanding that training will not effect the prevention of slips/lapses or violations, only mistakes,
- Stating that operators are highly motivated and thus not prone to unintentional failures or deliberate violations,
- Ignoring the human component completely, failing to discuss human performance at all in risk assessments, leading to the impression that the site is unmanned,
- Inappropriate application of techniques, such as detailing every task on site and therefore losing sight of targeting resources where they will be most effective,
- Producing grand motherhood statements that human error is completely managed (without stating exactly how).

Companies should consider whether any of the above apply to how their organisation manages human factors.

Much of the loss associated with occupational accidents is attributed to human error. Despite remarkable advances in safety management, errors, incidents and accidents continue to occur. What do we know about human error? Would a better understanding of error change our way of thinking about safety management? This symposium will take a fresh look at the causes of errors and offer new strategies to improve your organization’s safety.

Follow this learning chronology and discover a new way to manage safety.

Join us for this symposium and learn:

- The physiology and psychology of human error
- Causes of errors and incidents
- Clues to identify circumstances with an increased chance of human error
- Approaches and tools to reduce errors, incidents and accidents
- How the system can be fixed
- Prevention through design

Be able to:

- Discuss the reasons human error occurs
- Identify circumstances that produce an environment at risk for losses
- Recognize causal relationships between the system and the occurrence of accidents
- Implement practical approaches and tools to reduce error
- Communicate to your organization the process of prevention through design

What is Error Management?

By error management we mean the using all available data to understand the causes of errors and taking appropriate actions, including changing policy, procedures, and special training to reduce their incidence of error and to minimize the consequences of those that do occur.

Implementing Error Management

Successful error management places six requirements on organizations:

- Trust
- A non-punitive policy toward error
- Commitment to taking action to reduce error-inducing conditions
- Data that show the nature and types of errors occurring
- Training in error avoidance and management strategies for employees
- Training in evaluating and reinforcing error management for instructors and evaluators

These requirements are closely linked and success in coping with error requires their combined implementation. Effective error management requires trust between management and pilots regarding a shared commitment to safety. This trust can be fostered by a credible, non-punitve attitude toward errors that encourages employees to share their errors and to participate in actions to prevent recurrence. A non-punitve policy regarding error does not imply that any organization can tolerate willful violations of SOPs or regulations. Part of the trust also includes the belief that management will make every effort to deal with conditions that foster error.

Management must also make it clear that, in the interests of safety, it is essential that data defining the nature and frequency of errors must be available to the organisation. Without data, safety strategies only represent guesses as to what actions are needed. Evaluations conducted under jeopardy conditions (i.e., with the possible loss of certification involved) are not likely to provide a valid picture of how cockpits are managed in ordinary line operations when there is no surveillance. Strategies to obtain needed data will be discussed in the following section.

V. ERROR MANAGEMENT CRM (EMCRM)

Proper skill based training and safety training must also support error management. We have proposed a fifth generation of CRM that is predicated on error management. In Error Management CRM (EMCRM), the limitations of humans and the inevitability of error must be established as a baseline. Under this framework, the concepts of EMCRM can be clearly understood as countermeasures against error. The error management framework reflects a cultural universal – the avoidance of error and enhancement of safety. Strategies in support of these objectives should be more readily accepted than more vague characterisations of early CRM as techniques for enhancing teamwork.

New training for instructors and other evaluators will also be required for error management. These key personnel have served primarily as ‘error detectors’ in the past. Under the error management approach, their task is expanded to include evaluation of how errors are managed and reinforcement of effective strategies (Tullo, in press).This training needs to stress recognition of the triggers of error and understanding of how CRM practices can not only enhance error avoidance but also intervene to mitigate the severity of error outcomes. The reinforcement of error management practices in line operations is, of course, essential to the success of the strategy.

CONCLUSION:

In summary, To error might be human, but it can be costly for employers. It has been estimated that up to 90% of all workplace accidents are due to human error. Reducing on-the-job injuries can save employers money on healthcare, disability and workers’ compensation costs. Error management supported by valid data can provide a useful framework within which organisations focus efforts to enhance safety. Within this context, EMCRM should prove to be an even more valuable tool than it has been in the past. Given that the outcomes are universally valued, it should be possible to establish relationships of trust that will facilitate the effort. Regulators also must support these efforts by recognising that safety requires more than a traditional blame and punish approach to regulation of the organisation system.

REFERENCES


