Human Failure Analysis (HFA):
A great opportunity to analyse root causes of incidents

Written by:

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- *Even with all the systems, processes, barriers and training in place, why are we having incidents?*
- *Why are some of our most experienced operators making fatal, or near-fatal errors?*
- *Why, even after a full incident investigation and completing actions, do we still have repeat incidents?*

Organisations will recognise human failure as being a contributor to incidents and accidents and will mention human error in risk causal descriptions and incident investigation reports, but not many organisations are focussing on analysing human failure on a formal basis. Two kinds of human failure have been identified:

- Unintentional failures: physical errors (not following the correct course of action) and mental errors (doing the incorrect thing while thinking it is correct).
- Intentional failures: violations and knowingly taking short cuts or not following procedures.

In 1990 James T Reason, in his book on Human Error, likened the causal factors that contribute to an error to holes in slices of cheese stacked together (graphic alongside). In instances where these holes, or errors, align the likelihood of serious accidents increases.

Soon afterwards safety investigators in the aviation industry started using the Swiss Cheese model to analyse human failure causes in aviation accidents. Now the analyses of human failure using the concept of the Swiss Cheese model expands to be analysing accidents in many industries including engineering and health related incidents.

Due to safety pressures the most recent expansion was into the mining industry where safety officers are now using the methodology in investigating mining accidents.

USING THE SWISS CHEESE MODEL

Referring to the graphical depiction alongside, of the use the of the Swiss Cheese model to analyse human failure, the following paragraphs focus on a high level introduction to each area analysed, the pitfalls to guard against and the benefits from using this methodology.
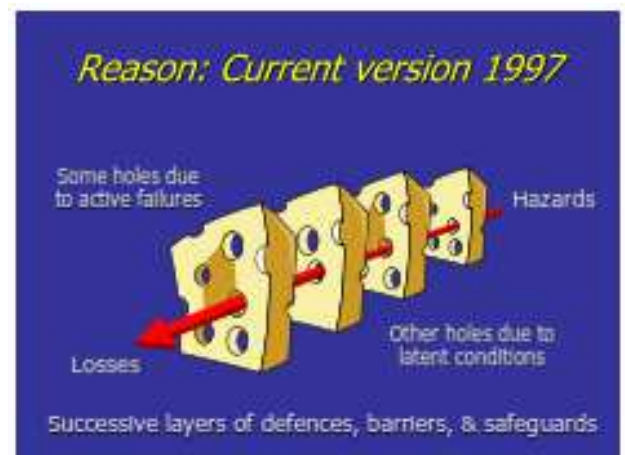
In using HFA to identify the root causes for an accident, various questions are asked. These are based on the possible causes (holes in the slices of cheese) for the accident in the following areas (slices of cheese):

- Organisational level (management)
- Workplace (supervision)
- Person (operator)

At the **organisational level,** factors such as the management decision-making process, actual decisions, organisational processes and overall culture affecting the specific accident or area/process where the accident occurred are analysed.

The **workplace** or area where the accident occurred is analysed in terms of supervisory conditions focusing not only on errors/mistakes but also on causes that could produce violations of standard work procedures.

The holes in the last slice of cheese are to be analysed focus on the **person(s)** / operator(s) directly involved in the accident. Here the focus is on detailing issues relating to the person(s)' ability to perform the work, training received (or not) and the possible purpose full violation of procedures.

In all three areas above, direct; indirect and latent causes are considered to ensure that the most probable root cause(s) are identified.
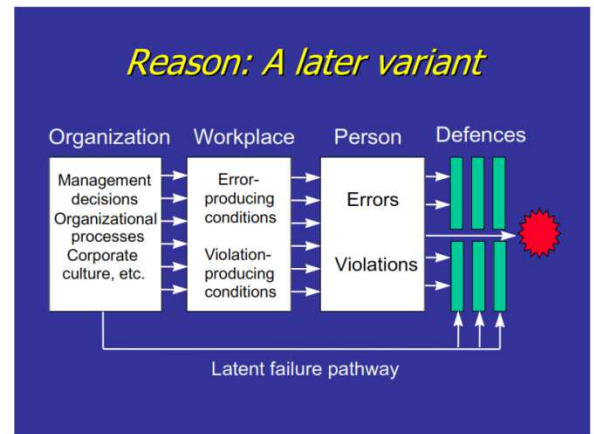
BENEFITS OF HFA

In using the HFA methodology an organisation has the opportunity to, not identify the actual root causes of an accident, but to also to resolve these causes and have an improved chance of avoiding future occurrence of similar accidents elsewhere in the organisation.

It is often found that comments after analyses, especially those higher up in the chain of command include "we were just lucky that this did not happen in other areas" and "this is an organisational wide issue".

CHALLENGES IN USING HFA

There are however a few challenges which will require consideration when using HFA. These include:

- **Negative operator perception**

  If not dealt with carefully, person(s) involved may feel personally attacked or that management wants to shift the blame.

- **Only using part of the HFA**

  In only analysing some areas, e.g. excluding the organisational level, the full extent of the causes may not be discovered and the analyses may not realise all the benefits.

- **Insufficient buy-in from management**

If management perceives the exercise as a "tick box exercise", the real benefits of improving the work environment will not be realised.

KEY CONTROBUTORS TO THE SUCCESS OF HFA

Some key contributors to the success of a HFA in root cause analysed requires include:

- **Understanding why HFA is being used**

  The need for, and the benefits to be derived from using a HFA to analyse an accident needs to be fully understood by all stakeholders. It is essential that these stakeholders include senior management, middle management, person(s) involved and where applicable any third parties such as government and organised labour.

- **Using somebody that "did it before"**

  Using experienced facilitators improve the changes of avoiding many of the pitfalls that accompany an HFA. The investigation has a better chance of not being seen as a witch-hunt by management and/or being influenced by internal relationships.

  In using experienced investigators, the outcome could also be better benchmarked against similar cases and against benefits such as implementation of improved mitigations will realise.

The benefits of using an HFA to analyse the root causes of an accident are significant and HFA has a good chance of leading to improved mitigation of risks and incidents that will not only benefit areas where the accident occurred, but throughout the organisation.

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