RISK AWARE
Insights in Risk Management
Issue 11

Procedural controls – Are they effective?

In dealing with measures to mitigate risk, it often happens that procedures are chosen as a control action. This is understandable, because higher-level controls that are available may be less feasible or more costly. Eliminating the source of the risk - or redesigning the equipment or systems - are likely to be more effective than procedural controls, but the cost benefit may not be demonstrated.

This concept is recognised in regulations. For example, NSW Occupational Health and Safety Regulation 2001 obliges us to adopt measures (in the order specified) to minimise risk to the lowest level reasonably practical. Procedural controls rate second last in the hierarchy. [1]

Despite this, procedural controls are commonly used. But just how effective are they? What can be done to strengthen them as a control measure? Are there cases where their use would be ill advised?

How to make procedural controls more effective

There are a number of familiar requirements if procedural controls are to be effective:

- Procedures (rules, standards, etc) need to be clear, understandable and unambiguous
- People need to be trained, motivated and provided with the right resources to carry out required procedures
- Quality assurance and audit systems may be necessary
- Accountabilities need to be clear
- Accountabilities of individual persons need to be agreed (like a contract), rather than merely imposed
- Supervisor checks, verifications and sign-off authorisations may be necessary

A few traps

Some organisations are very focused on rules, standards and compliance. Supervisors work hard to make sure that every task, every routine job, has a set of standards that must be adhered to.

Whilst this approach may appear laudable, it could be that in the absence of other measures, things are actually made worse. Workers, supervisors and managers may feel that "If all rules (standards, etc) are followed, it must be safe."

This is the paradox of rules:

> *People come to believe that following the rules is enough, yet fail to realise that rules (procedures, standards, etc) can never fully anticipate the circumstances that might unfold during the course of the work.*

Simple solution, you say – make the rules more comprehensive. This brings us to Paradox Part 2:

> *"The more comprehensive the rules, the less they will be referred to and the less they will be understood".*

This is not to say that rules, procedures and standards are unnecessary – far from it. But it does say that over-reliance on strong procedural and rule-based systems may of itself induce more risk.

What can we learn from this?

The message is simple – rules and procedures, even if well-designed, are often ineffective as control measures.

- Look at existing procedures. Are they clear and understandable?
- Recognise that procedures can never fully anticipate all of the circumstances that might unfold
- For critical systems, consider more effective measures from the hierarchy of controls

Three case studies

At **Glenbrook** in the NSW Blue Mountains, an electrical fault caused railway signals to fail to red indication as per design. Procedures permit trains to go past red signals, so long as particular precautions are taken. In fact, 84 chapters of rules governed these operations. Owing to confusion, misunderstanding and other factors, the driver of a train believed that he had verbal (radio) authorisation from the control centre to pass a red signal, and that there were no further problems ahead, at least up to the next signal. As it happened, a preceding train was moving very slowly and was not sighted in time to avoid a collision. Seven people died. [2]

Regarding the 84 chapters of rules, witnesses described them as "incredible waffle", "ambiguous and constantly changing", "trainers not clear as to the intent". The rules were later simplified.

Near **Los Angeles, CA,** an Alaska Airlines aircraft crashed into the ocean whilst attempting to maintain control with a defective mechanical component. The particular device, located on the tailplane or "horizontal stabiliser," controlled the nose-up, nose-down pitch of the aircraft. A screw thread actuator had jammed, then stripped completely in mid-flight, owing to poor lubrication, testing and inspection procedures. Eighty eight persons died.[3]

Initially the aircraft manufacturer regarded the actuator as a device that would deteriorate gradually, in a way that would be detected by routine wear measurement procedures and minimised by routine lubrication procedures. As it happened, the device was very difficult to lubricate and check owing to the confined space and small access covers. Casual observation of workers revealed several different methods of lubrication, not all satisfactory nor compliant. The design was subsequently altered.

At **Sydney Kingsford Smith Airport**, a Qantas Boeing 747 experienced a fire in the wheel brakes after landing and taxiing to the terminal. Passengers were evacuated using the inflatable slides. There were minor injuries.[4]

Procedures for applying wheel grease were not fully followed - and the wrong grease was used. Previous similar incidents had occurred. Procedures and systems were strengthened.

References:

1. NSW OHS Regulation 2001: Clause 5 - Meaning of "control" of risks.
2. McInerney, AJ: *Special Commission of Inquiry into the Glenbrook Rail Accident*, 11 Apr 01.
3. National Transportation Safety Board, 2002. *Loss of Control and Impact with Pacific Ocean, Alaska Airlines Flight 261... Anacapa Island, CA, Jan 31, 2000.* Aircraft Accident Report NTSB/AAR-02/01, Washington DC.
4. Australian Transportation Safety Bureau: *Boeing 747-438, VH-OJU, Sydney Aerodrome, 2 Jul 03*. Investigation Report BO/200302980.

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