

INCIDENT REPORTING SYSTEMS, A COMPARISON OF FOUR CASE STUDIES

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Incident reporting systems are used to report incidents and near-misses. These systems can have a wide reach, when they are used by several organisations within a sector, or can be limited to a single organisation.

Both types of system are beneficial, as they enable information to be shared across, or within, organisations, which may lead to active learning (ie, becoming aware of an issue and doing something to fix it) and consequently fewer future incidents and near misses. For an incident reporting system to be successful, certain characteristics need to be present.

This article covers these essential characteristics, provides three examples of effective reporting systems, and one example of a system which, despite being created with the best intentions, did not achieve what it was set to do, as it lacked those traits.

Characteristics of effective incident reporting systems

Reporting systems succeed when there is trust, achieved by ensuring that there will not be retribution for reporting accidents or near misses; to enable trust there must be a guarantee of confidentiality, which can be provided by de-identifying the reports or enabling anonymous reporting. It's important to remember that, in environments concerned with attributing culpability, errors still occur, however willingness to report might decline, in which case learning from failure will not occur. The system should also be administered by an independent body, or at least the incident investigations should be carried out by an independent team.

Reporters need to be assured that active learning (ie, becoming aware of an issue and doing something to fix it) will occur, that reporting will result in positive action, as otherwise reporting will be a waste of time. The system needs to be accessible and easy to use. Finally, organisations need to be educated to the benefits of reporting systems, to overcome their need for secrecy or their fear of litigation, and increase the rate of reporting.

Reporting systems are widely used, some good examples are the ASRS, CROSS, and FINANS reporting systems

The NASA Aviation Safety Reporting System (ASRS) captures confidential reports, analyses the data, and disseminates vital information to the aviation community (<https://asrs.arc.nasa.gov/>). The system was created following the December 1st 1974, Trans World Airlines flight 154 crash, which killed the 92 people on board, and the realization that two near misses (one on the same day) had previously occurred in the same circumstances, but knowledge of this was not widespread, as it was confined to the respective airlines individual reporting systems.

The characteristics of ASRS are very much those of an effective reporting system. An environment of trust is provided, with people feeling safe to report. The identity of reporters is protected and the non-punitive element of the system is respected, with no information submitted used for disciplinary action. Reporting is voluntary, with aviation personnel motivated to report, because reporting highlights issues from which learning occurs. The system is independent, with reports analysed and investigated and data held by NASA and not by aviation organisations, and easy to use. ASRS is effective because the data contained in the reports is rapidly transformed into intelligent and useful safety information and shared with the aviation community. Time-critical information is shared via alert messages, while non time-critical information is published in regular newsletter. All information is stored in the ASRS database, available to the public for further analysis. All this promotes active learning.

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ASRS has been very successful and contributed to today's high safety standards of the aviation industry and increasingly it is being acknowledged that this model of incident reporting provides an accurate early warning system for the identification of emerging issues. Other industries have acknowledged the benefits of ASRS and have adopted, and adapted, the model to increase their own safety efforts. The most successes have been experienced by the nuclear industry, the maritime and rail sectors, and by the medical community. Other industries, also attracted by the benefits of such reporting systems, started introducing their own versions: the Confidential Reporting On Structural Safety (CROSS) system established in 2005 is an example and so is the FINANS anonymous reporting system created and implemented for a financial trading organisation.

CROSS (<https://www.structural-safety.org/>) is an internet-based system, with confidential reports submitted via user-friendly web forms. The identity of reporters is protected: the reports are not anonymous, because further information may be needed from reporters, however once all information has been collected the forms are de-identified.

CROSS facilitates active learning: CROSS reports and recommendations have contributed to strengthening regulations and structural requirements, and have highlighted concerns which have been addressed by regulators. The most critical reports, and related analyses, are published in quarterly newsletters and added to the CROSS database. Other reports are added to the CROSS database without further analysis, and may be included in other publications if trends are identified. CROSS reports have contributed to raise risk awareness by providing advice on common industry design issues, and to a reduction in the number of deaths and serious injuries, as industry and regulators have acted on communications issued, resulting in improved safety culture of the UK construction industry. The success of the CROSS system is also reflected by its adoption outside the UK, with CROSS now sharing its database with Southern Africa, Australia, New Zealand, the USA and soon Germany.

Financial organisations also use incident reporting systems, as although these are not safety-critical entities, accidents can be highly damaging for both organisations and economies. In a financial trading organisation, a confidential incident reporting system (FINANS) was implemented to facilitate voluntary reporting via a website. In a two-year period the system recorded 1,042 reports – approximately 10 per working week - a high rate of reporting, possibly due to reporters belonging to the same organisation and having heightened system awareness due to communication and training. Analysis of the incident reports enabled the identification of the causes of errors and accidents, as well as the skills and behaviours that contributed to errors detection and avoidance. The analyses provided many insights that could contribute to active learning. For example, the research found that “teamwork and situation awareness skills are essential to capturing and preventing error” which seems counterintuitive for an industry like financial trading, where performance is highly individualised. This information may be useful when introducing system or organisational changes, or when recruiting, as it increases knowledge of communication and cooperation needs between teams, as well as informing on the operator skills that could lead to error reduction and avoidance. Through the incident reporting system, the researchers were able to highlight causes of incidents and near-misses as well as the skills and actions needed to avoid incidents, enabling the organisation to adopt targeted corrective action to better manage risk.

What happens when an incident management system is not effective?

As part of a research into the Pike River Mine disaster, the Pike River Coal (PRC) incident reporting system was analysed. The system lacked many of the characteristics of an effective incident reporting system.

The PRC incident reporting system was not confidential, which resulted in employees suffering negative consequences for the reporting they had made, while repeated reporters were perceived to be troublemakers, or were made to do additional work to fix the issues they had reported. The system lacked independence, with the incident reports often investigated by the reporter's own manager or colleagues. This lack of independence sometimes resulted in hostility and ostracisation, and in turn decreased the trust in the reporting system.

Rapid and intelligent feedback following reporting of issues helps to ensure that reporters keep reporting. At PRC there was some evidence of reports acted on, but many more were simply not addressed, many repeated issues not actioned. There was no established mechanism to close the feedback loop to reporters, hence workers would not be aware of any action taken as a result of accidents or near misses. The lack of action and feedback had a negative effect on the reporting culture, employees no longer saw value in reporting and doubted that reporting would address the issues raised, deterring them from further reporting. It is unclear how many accidents were reported compared to accidents occurred, quite possibly only a tiny percentage. PRC proved it did not possess a learning culture when it cleared the backlog of accident reports without investigating them, denying itself the opportunity to analyse and learn from the reports, effectively negating the main purpose of reporting.

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The deficiencies of the reporting system created resentment and anger and ultimately failed the employees, as one of the avenues that should have been available to them to raise concerns was not viable.

Conclusion

Confidential incident reporting systems can promote knowledge sharing by providing and encouraging a culture where it is safe to share information on incidents and near misses. In turn, this information can foster active learning, which occurs when changes are implemented as a result of lessons learnt. Trust in the reporting system is essential for the reporting to happen. Trust in the system is achieved not only by fostering a just culture (where individuals are not punished for actions, omissions or decisions taken by them that are commensurate with their experience or training, but where gross negligence, willful violations and destructive acts are not tolerated) but also by guaranteeing confidentiality, achieved by de-identification of the reports or by enabling anonymous reporting, and ensuring that incidents are investigated by independent teams.

The ASRS, CROSS, FINANS reporting systems support the view that effective reporting systems promote active learning: aviation safety has increased considerably since ASRS was introduced and it is generally acknowledged that without confidential reporting systems the sector would not have reached such safety standards. CROSS and FINANS have also promoted active learning: CROSS in a similar fashion to ASRS, with alerts and regular newsletters sharing knowledge and influencing industry and regulators, while FINANS has shown that by analysing data from reports, causes of errors and near misses can be identified, and subsequently addressed. The last system, that of PRC, shows how, when the described key characteristics are lacking, active learning is inhibited and reporting is rendered meaningless.

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