

Nuclear Near Misses and Their Learning for Healthcare

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Abstract : Background: It is estimated that one in ten patients admitted to hospital will suffer an adverse event in their care. While the majority of these will result in low harm, patients are being significantly harmed by the processes meant to help them. Healthcare, therefore, seeks to make improvements in patient safety by taking learning from other industries that are perceived to be more mature in their management of safety events. Of particular interest to healthcare are 'near misses,' those events that almost happened but for an intervention. Healthcare does not have any guidance as to how best to manage and learn from near misses to reduce the chances of harm to patients. The authors, as part of a larger study of near-miss management in healthcare, sought to learn from the UK nuclear sector to develop principles for how healthcare can identify, report, and learn from near misses to improve patient safety. The nuclear sector was chosen as an exemplar due to its status as an ultra-safe industry. Methods: A Grounded Theory (GT) methodology, augmented by a scoping review, was used. Data collection included interviews, scenario discussion, field notes, and the literature. The review protocol is accessible online. The GT aimed to develop theories about how nuclear manages near misses with a focus on defining them and clarifying how best to support reporting and analysis to extract learning. Near misses related to radiation release or exposure were focused on. Results: Eight nuclear interviews contributed to the GT across nuclear power, decommissioning, weapons, and propulsion. The scoping review identified 83 articles across a range of safety-critical industries, with only six focused on nuclear. The GT identified that nuclear has a particular focus on precursors and low-level events, with regulation supporting their management. Exploration of definitions led to the recognition of the importance of several interventions in a sequence of events, but that do not solely rely on humans as these cannot be assumed to be robust barriers. Regarding reporting and analysis, no consistent methods were identified, but for learning, the role of operating experience learning groups was identified as an exemplar. The safety culture across nuclear, however, was heard to vary, which undermined reporting of near misses and other safety events. Some parts of the industry described that their focus on near misses is new and that despite potential risks existing, progress to mitigate hazards is slow. Conclusions: Healthcare often sees 'nuclear,' as well as other ultra-safe industries such as 'aviation,' as homogenous. However, the findings here suggest significant differences in safety culture and maturity across various parts of the nuclear sector. Healthcare can take learning from some aspects of management of near misses in nuclear, such as how they are defined and how learning is shared through operating experience networks. However, healthcare also needs to recognise that variability exists across industries, and comparably, it may be more mature in some areas of safety.

Keywords : culture, definitions, near miss, nuclear safety, patient safety

Conference Title : ICNSP 2022 : International Conference on Nuclear Safety and Protection

Conference Location : London, United Kingdom

Conference Dates : September 22-23, 2022