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## Product Safety Culture: A New Variant of Safety Culture?

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### Synopsis

Product safety culture is a new research area which concerns user safety rather than worker or process safety. The concept appears to have emerged after the investigation into the Nimrod aircraft accident (Haddon-Cave, 2009) which echoed aspects of NASA's Challenger and Columbia crashes. In these cases, through a blend of human and organisational failures, the culture deteriorated to the extent of damaging product integrity, resulting in user fatalities. Haddon-Cave noted that it was due to a failure in leadership and organisational safety culture that accidents such as the Nimrod happened, where the aircraft exploded due to several serious technical failures, preceded by deficiencies in the safety case. Now some organisations are starting to measure product safety culture.

This is important in day-to-day life as well, where a product failure as a result of poor organizational safety culture, can cause user harm or death, as in the case of Takata airbags scandal in 2015. Eight people have lost their lives and many were injured. According to investigation reports this was due to the company's safety malpractices of fixing faulty airbags and proceeding to install them in vehicles, as well as secretly conducting tests to assess the integrity of their product and then deleting the data and denying safety issues as a result of the company's cost-cutting policies. As such, organizational culture, specifically the applications of safety culture, can have far-reaching consequences beyond the workplace of an organisation.

Existing research into worker and process safety culture has examined specific dimensions and measured their effectiveness in relation to recordable safety outcomes and worker safety behaviour. The main cultural dimensions appear to include management commitment to safety, safety systems and communication. But do the same cultural factors affect product safety? There may also be need to involve the aspect of technology (such as equipment used to produce a product or a service) in safety systems when considering the manufacture and usage of products. Perhaps this also applies within safety culture in general to ensure safe and efficient productivity of an organisation through good understanding and appropriate safety practices and operation of relevant equipment. Due to the impact of human behaviour on product safety, it would be pertinent to examine whether the dimensions relevant to worker and process safety culture are also components of product safety culture. It is proposed that this would require approaching the subject more from the safety systems perspective, considering that company policies and safety procedures are highly relevant in informing appropriate product safety practices, including workers' behaviours that affect product safety. This would be critical in high reliability organisations to mitigate further accidents and improve the overall safety culture of an organisation, such as in the nuclear industry.

Additionally, management commitment to safety should not be considered separately within the organisation but rather integrated into the aspect of safety systems. The reason for this is that management commitment to product safety is a result of organisational safety culture policies (therefore derived safety systems) that focus on appropriate worker practice and procedures. To summarise, product safety culture should be considered as the interplay between human factors and technology (i.e. work equipment used in product assembly) affect-

ing the organisation's safety culture to determine whether the influences of safety systems of an organisation's safety culture impact product safety through human behaviours and practices.

This paper will attempt to establish how product safety culture could be accurately defined and whether it is a variant of safety culture in general. Relevant literature, such as food safety culture and patient safety culture studies will be used to examine the impact of worker behaviour on product/service safety. Major product safety failures will illustrate which aspects of organisational culture were implicated. The established safety culture dimensions will be compared to those which appear to underpin product safety culture to see if they match or if there are distinct dimensions that should be considered for product safety culture. This would be relevant also to explore the potential impact on product safety behaviour of workers or product safety outcome measures (i.e. failures, malfunctions). Such findings could be relevant to the nuclear industry as it considers 30 years of research into safety culture.

## **Country or International Agency**

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